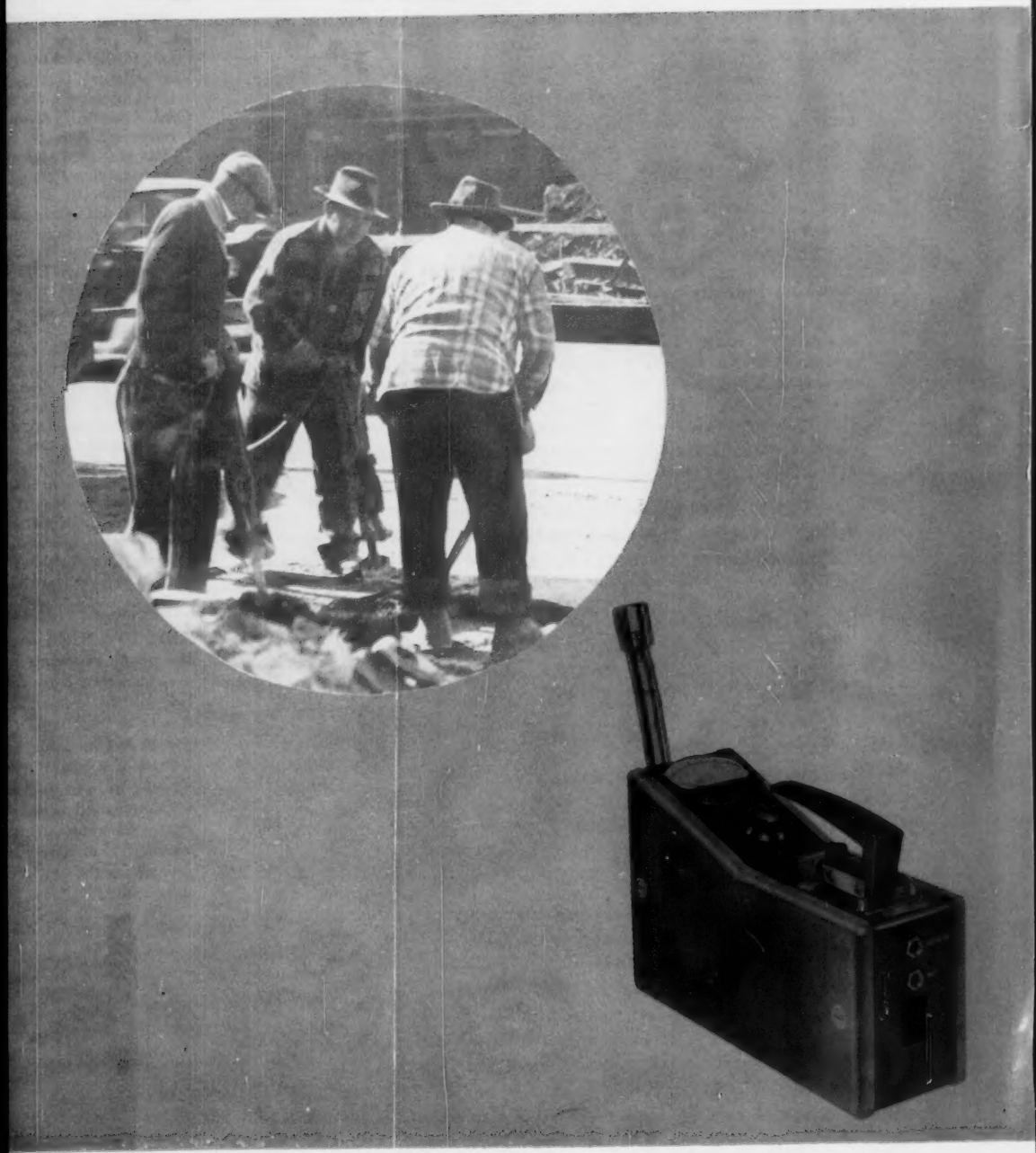
the magazine of STANDARDS



sound level meters . . . page 325

NOVEMBER 1961

the magazine of STANDARDS

Standardization is dynamic, not static. It means not to stand still, but to move forward together.

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Opinions expressed by authors in THE MAGAZINE OF STANDARDS are not necessarily those of the American Standards Association.

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ASA

THE COVER: In response to demands for greater accuracy in measuring noise, and increasing requirements for protection of the public against noise, new American Standard specifications have just been issued for sound level meters. The new standard reflects changing requirements in modern noise technology—requirements that are changing so rapidly that the committee responsible for this standard is already planning a study to prepare for the next revised edition when it is needed.

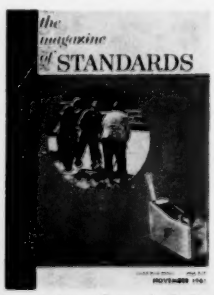


photo courtesy General Radio Co.

Roger Gay to Succeed Hussey

Named ASA Managing Director
Effective January 1, 1962

ROGER E. GAY, former president of The Bristol Brass Corporation, will succeed Vice Admiral George F. Hussey, Jr, USN (Ret) as managing director of the American Standards Association effective January 1, 1962. John R. Townsend announced Admiral Hussey's retirement and Mr Gay's appointment on November 1. Mr Gay is leaving his management consultant practice to become ASA's third managing director. He joined the ASA staff November 1.

Mr Gay is a past president of the American Standards Association (1952-1954), served as a representative of the Copper and Brass Research Association on ASA's Board of Directors for nine years, and is a recipient of the Howard Coonley Medal. He is a Fellow of the Standards Engineers Society and in 1957 received the annual joint award of the SES and the American Society for Testing and Materials for "outstanding service in the interest of standardization."

Mr Gay has been closely associated with standardization on both industry and governmental levels. From 1943 through 1955, he served as president of The Bristol Brass Corporation and during that time served on ASA's Board of Directors and as ASA president. He was chairman of the Board of Bristol Brass when, in 1955, he was granted a two-year leave of absence to accept a position as director of cataloging, standardization, and inspection for the Department of Defense in Washington. Under his responsibility, a single identification and cataloging system was established for use by the armed forces. Over three million items were assigned a number in the Federal catalog system.

At ASA's Eighth National Conference on Standards in 1957, Mr Gay received the Howard Coonley Medal for spearheading "efforts of the Federal Government to develop more effective standardization practices and to coordinate government standards with those of industry."

While with the Defense Department, Mr Gay administered the new DoD standardization program which did so much to reduce the number and variety of items in the supply system.

During World War II, Mr Gay was a member of the War Production Board advisory committee to the copper and brass industry and chairman of a similar committee for the Office of Price Administration. He has held directorships of the National Association of Manufacturers, the Research Corporation, Copper and Brass Research Association, American Hardware Corporation, Whitney Chain Company, Bristol Bank and Trust Company, Bristol Traction Company, Bristol Associates, Connecticut Mining and Milling Company, Research-Cottrell Incorporated, and Physical Science Corporation.

Admiral Hussey has been managing director and secretary of the American Standards Association since 1948. A graduate of the U.S. Naval Academy, he served as chief of the Navy's Bureau of Ordnance during and after World War II. He has been active in many national groups, including the American Ordnance Association, of which he is a past president. He received the AOA's Blandy Medal in 1958, is a Fellow of the Standard Engineers Society, and is a Chartered Association Executive of the American Society of Association Executives.

During Admiral Hussey's service with the ASA, he held office as vice-president of the International Organization for Standardization (ISO) from 1959-1961. During the time he has directed the administrative affairs of the ASA, he has witnessed the approval of some 500 new American Standards. Admiral Hussey also has been instrumental in familiarizing industry with the benefits of standardization and has seen new standards projects started in the fields of nuclear energy, material handling, consumer goods, and data processing.

SOUND LEVEL

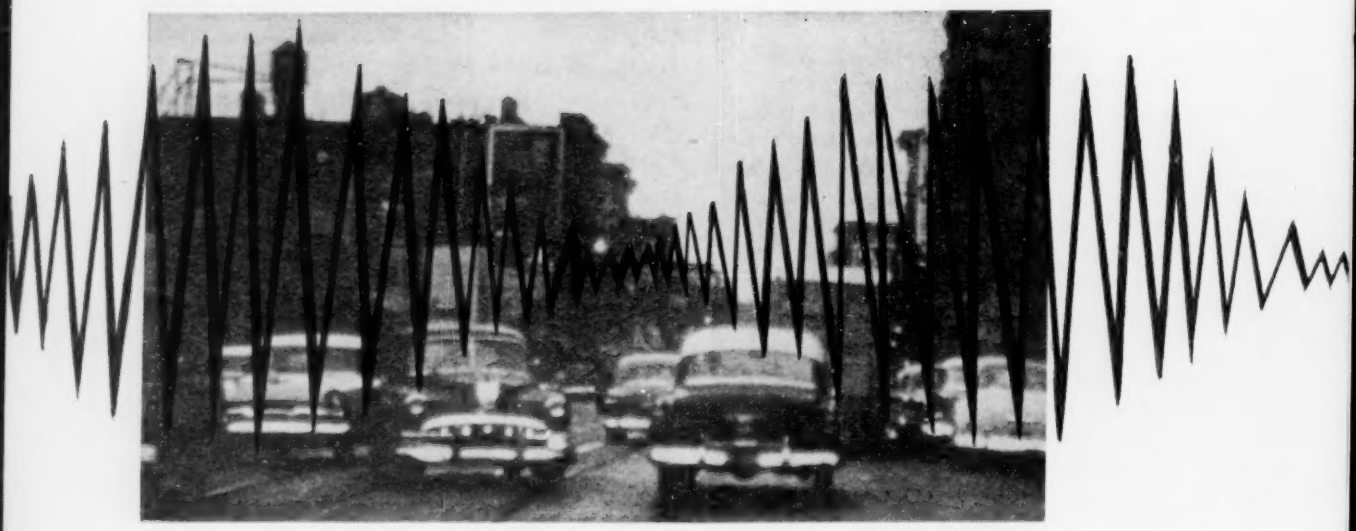


Photo from Shell Oil Co.

A survey of the problems of standardization

by HOWARD C. HARDY

MR HARDY, consultant in acoustics, Chicago, Illinois, was chairman of Working Group 18 (S1-W-18) of Sectional Committee S1, Acoustics. This working group developed the new edition of the standard on sound-level meters for consideration by the sectional committee.

METERS

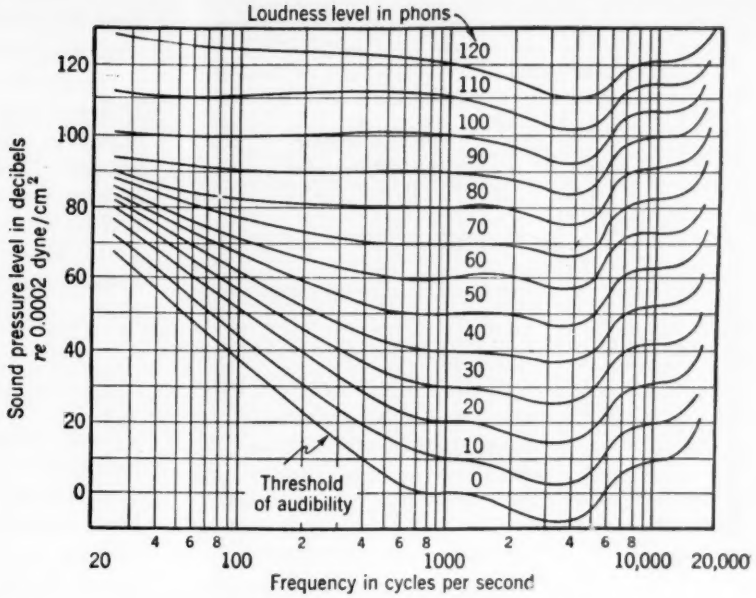


Figure 1. The Fletcher-Munson loudness contours.

THE SOUND LEVEL METER was developed about 30 years ago when electronic development had reached the stage where it was possible to make a battery-powered meter portable and stable enough to be acceptable for sound measurements. Its development was partially stimulated by the need to make noise measurements involved in production and reproduction of sound motion pictures. Since that time this meter and its descendants have been universally used for noise measurements. In fact, it is estimated that 99 percent of the use of the sound level meter is for noise measurements, which has led some persons to suggest it might be called a noise meter.

At the time the sound level meter was introduced, the famous Fletcher-Munson loudness contours for pure tones (Figure 1) had just been determined (published 1933), and it was realized that a single sound pressure reading could not measure human reaction. In fact, at low levels there is quite a different slope at low frequencies to the loudness contours than at high levels. For this reason, the meter was built with two additional networks, an attempt to fit the frequency response of the meter to the loudness contours of the human ear. An A-network was used for low levels (around 40 decibels), a B-network for medium levels (around 70 db), and C or flat network for high levels (around 100 db). The response of these networks, as given in American Standard Z24.3-1944 is shown in Figure 2.

From the very first, many scientists, including Dr Fletcher himself, pointed out that the loudness of complex tones could not be evaluated by an overall sound pressure level reading. This is principally because acoustical energy distributed over many frequencies is much louder than when concentrated in a narrow frequency band. With hindsight we can say also that the loudness contours for pure tones are not applicable to noises with energy distributed over many frequencies, nor, for that matter, are the contours when listening under earphones the same as when the sound is coming from a single direction or many directions.

Soon many persons began to notice discrepancies between their subjective reaction and the meter readings. Sounds which were the same loudness gave readings with differences as great as 20 db on the meter. For instance, the sound level inside an airplane is 105 db compared to 95 db in the subway, but most persons consider the latter as more objectionable. Sometimes, because of low frequency resonance, the overall sound level is higher when a muffler is added to an automobile engine than without it, although it is evident that adequate silencing has been accomplished. (There is a story that one muffler manufacturer, after such an experience, literally threw a sound level meter out of the window.)

However, despite these and other limitations, the

American Standard Specification for General-Purpose Sound Level Meters, S1.4-1961, is available at $1.30 per copy.

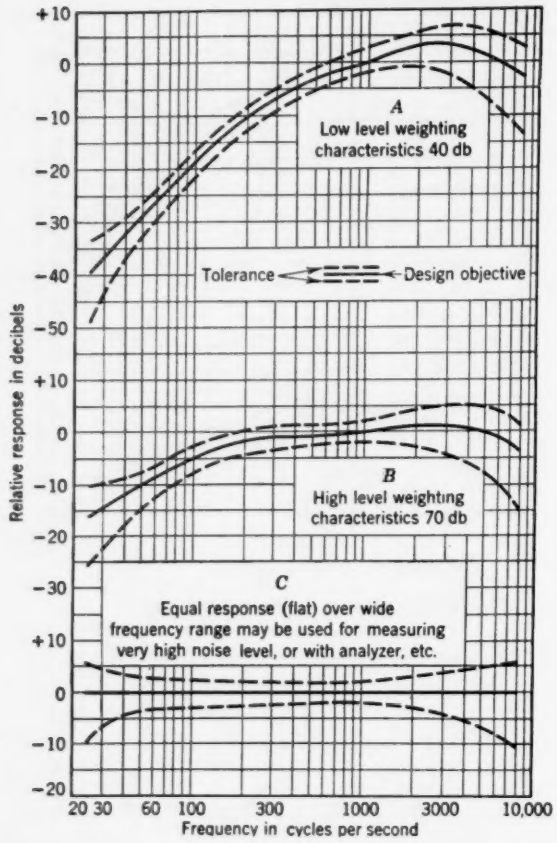


Figure 2. Frequency response characteristics and tolerances for sound level meters as specified by Z24.3-1944.

sound level meter is a very convenient instrument and many thousands of them have been sold. There has been a growing tendency, however, not to depend on the overall meter reading alone, nor on the weighted network reading, but to use it with analyzing equipment, the most common of which is now the octave band analyzer. (See American Standard Z24.10-1953.) In Figures 3 and 4 are shown the best known American sound level meters, both of which are designed to be used with associated equipment. One manufacturer, as shown in Figure 5, has brought out a meter which combines a sound level meter and octave band filter. In Figures 6 and 7 are shown other octave band filters.

Although the use of networks is not nearly so common now as formerly, especially for noise evaluation, the presence of the circuits on the meters has prompted ingenious engineers to find other use for them than that for which they were originally devised. It has been found, for instance, that using the A-network *at all levels* gives an approximate subjective rank order. Other uses are, for instance, to evaluate quickly the amount of low-frequency energy and to reduce low-frequency background during a high-frequency measurement. For these purposes it has been suggested that other networks might be even more convenient.

The first sound level meter standard was written in 1936 and was revised slightly in 1944. Since 1952, a committee (S1-W-18) has been working on a major revision of this standard. This was approved in 1960 and is now published (American Standard Specification for General Purpose Sound Level Meters, S1.4-1961). Some of the improvements and the philosophy behind these improvements will be discussed in this paper.

Limitations in Accuracy

NOISE MEASUREMENT has become more important, and more accuracy is being demanded of noise measurement equipment. In certain areas, legislation is being written in regard to the cause of hearing loss and the protection of the public against noise from transportation systems and industrial plants. More noise specifications are appearing in purchase requisitions. There has been and probably will be an increasing demand for more accurate meters.

The tolerances allowed in the old sound level meter standard (American Standard Z24.3-1944) are given in Figure 2. These tolerances were large, especially at the low and high frequencies. *This does not mean that any particular meter will depart from its design goal this much, nor that its instability is anywhere near this great.* The new tolerances are presented in

Figure 3. This instrument and the one shown in Figure 4 are the two best known sound level meters in the U.S.

TABLE I

Over-all Response and Tolerances of Sound Level Meter on A and B Weighting Networks

Frequency (cps)	A Network Response in db re: C Network	A Network Tolerance in db re: C Network	B Network Response in db re: C Network	B Network Tolerance in db re: C Network
25	−40.3	±2.0	−16.1	±1.0
32	−36.2	±2.0	−14.1	±1.0
40	−32.5	±2.0	−12.2	±1.0
50	−28.9	±2.0	−10.4	±1.0
63	−25.3	±2.0	−8.6	±1.0
80	−21.8	±2.0	−6.9	±1.0
100	−18.8	±1.5	−5.4	±1.0
125	−16.0	±1.5	−4.1	±1.0
160	−13.1	±1.5	−2.9	±0.5
200	−10.8	±1.5	−2.1	±0.5
250	−8.6	±1.5	−1.4	±0.5
320	−6.5	±1.0	−0.9	±0.5
400	−4.8	±1.0	−0.6	±0.5
500	−3.3	±1.0	−0.3	±0.5
630	−1.9	±1.0	−0.2	±0.5
800	−0.8	±0.5	−0.1	±0.5
1,000	0	±0.5	0	±0.5
1,250	+0.6	±0.5	0	±0.5
1,600	+1.1	±0.5	0	±0.5
2,000	+1.4	±0.5	0	±0.5
2,500	+1.5	±0.5	0	±0.5
3,200	+1.7	±0.5	0	±0.5
4,000	+1.8	±0.5	0	±0.5
5,000	+1.8	±0.5	0	±0.5
6,300	+1.8	±0.5	0	±0.5
8,000	+1.9	±0.5	0	±0.5

Figure 8 and Table I. The cause for the tolerances is chiefly a microphone problem and should be discussed in more detail.

The practical considerations which led to the choice of a sound level meter microphone are approximately as follows:

1. *Low level response.* It must be capable of being used for measurements at 25 db or below.

2. *Ruggedness.* It must not be easily injured by mechanical handling.

3. *Low cost.* Since the final sales price represents considerable mark-up of the components, the instrument companies feel these are rather rigid maxima on the procurement price of microphones.

4. *Stability.* Once the meter is adjusted, the microphone sensitivity should not drift due to temperature, mechanical fatigue, or other ambient conditions.

5. *Flatness of frequency response.* The microphone frequency response should be as flat as possible over the frequency range of the sound level meter and it should not be necessary to resort to electronic circuitry to obtain this requirement.

6. *Directional response.* The microphone should be as non-directional as possible.

7. *Extraneous influences.* The microphone and associated circuits should be as free as possible of influences such as electromagnetic fields, wind, vibration, etc.

There are also other points which are only minor. These considerations have led in the United States to the almost universal choice of the piezo-electric crystal microphone. Now the demand for such microphones does not represent a very large market, although the tolerances required are high. This technical dilemma is solved at present by selecting the microphone with the best frequency tolerances from the production run of a good quality microphone designed for other uses.

A deliberate study of such microphones shows that in the middle frequencies their response is flat and reproducible, but each individual microphone has resonant effects at high frequency which cause its response to pure tone to vary 2-7 db. (For averages over a broad-band noise in octave bands, for instance, the response could be much flatter with deviations of the order of 1-3 db.) These variations are different for individual microphones and occur at slightly different frequencies. At low frequencies, there is also considerable variation in the slope of the response curve among different microphones.

Some of the manufacturers provide more precise microphones which usually sacrifice other capabilities, such as portability, ruggedness, or dynamic range. This will not be discussed in this article, which covers only the general purpose sound level meter.

Figure 4. This meter and the one shown in Figure 3 are both designed to be used with associated equipment.

Figure 5

Figure 6

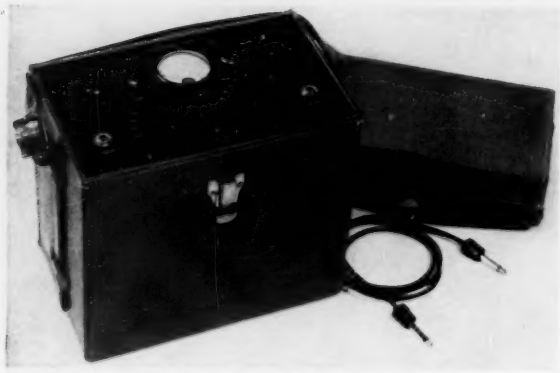


Figure 7

The meter shown in Figure 5 combines measurement of sound pressure level and frequency analysis. Figures 6 and 7 show octave band filters of different makes.

Other Improvements in the New Standard

ONE OF THE FIRST ACTIONS of S1-W-18 was to decide that more than a revision was necessary; therefore, practically a completely new draft of the standard has been written. The committee which prepared this new standard after considerable work consisted of representatives of all the sound level meter manufacturers and some of the component manufacturers, as well as scientists representing most of the leading acoustical laboratories, and a few persons with general scientific interest. The personnel of the committee is listed elsewhere in this article.

The revised standard has had a thorough review by the S1 committee and its antecedent, the Z24 committee. It has gone through three ballots. During this time there has been considerable education of the public in the technology behind the sound level meter. This has resulted in a symposium on the subject which was presented at the 53rd meeting of the Acoustical Society of America in New York City in May, 1957. Some of the recommended changes made by the S1-W-18 committee were not accepted by the parent committee. It is believed, therefore, that most of the points have had a thorough airing by representatives of all industries involved, including the general public.

The committee was faced with the fact that thousands of sound level meters are on the market and many more of the same general type will be marketed in the next few years. It was apparent to the committee that noise technology is going through a period of adaptation of new ideas, many of which are not ready to be standardized. There is also reason to believe that the customer demand will produce better meters in the future.

For these reasons this new standard, which is believed to be a considerable improvement over the old one, can only be considered as an interim standard.

Considerably more material has been added to the new standard than had been in the earlier one. Included are the following:

1. More definitions (and revision of others).

2. A new section (Section 3) on "Characteristics and Tolerances." This supplants and adds to the material in various appendices in the older standard.

4. A whole new section (Section 5) on "Extraneous Influences."

5. A whole new section (Section 6) on "Calibration." For the first time, calibration methods are outlined which enable the meter to be calibrated as a unit and, therefore, increase considerably the accuracy and reliability of the *individual* meter over the *tolerance* of a group of instruments.

6. In an appendix, a new section on tests for microphonics.

In line with the modern philosophy of design and use of the sound level meter, several major changes from the old standard are incorporated. They are as follows:

1. All network tolerances are referred to the *C*-network.

2. The networks are prescribed by relatively simple resistance-capacitance circuits.

3. The tolerances on the *C*-network are considerably tightened.

At a point in the development of the new standard, the committee encountered a semantic problem. There were some individuals, following the currently accepted *definition,* who said that a sound level meter was simply a sound pressure-level meter with network circuits. It was felt by the committee that there are other more important specific restrictions than networks which define a sound level meter and make it more specific than a sound pressure-level indicating device. These are:

1. It is a portable meter, most commonly powered by batteries and used chiefly for the measurement of airborne noise.

2. It has a limited frequency range as specified by the standard.

3. Its frequency response before calibration is within a certain specific tolerance.

4. Only a certain type rectification of the amplified signal is allowed.

5. It has an indicating meter with a certain specified dynamic characteristic.

6. Provision is made for obtaining an output signal.

It is apparent that a new definition of the sound level meter is needed and the one suggested by the committee is as follows:

"2.2.2 *Sound Level* (*Noise Level*). The sound level, in decibels, is the reading of a sound level meter fulfilling the requirements of this standard. The weighting network shall be stated."

It is believed that this definition is in the spirit of the original concept of the meter and the general purpose for which the device was intended.

Personnel of S1-W-18

H. C. Hardy, *Chairman,* Howard C. Hardy and Associates, Chicago, Ill.

R. E. Allison, Allison Laboratories, Hilo, Hawaii

B. B. Bauer, CBS Laboratories (Formerly Shure Bros, Inc), Stamford, Conn

G. L. Bonvallet, Howard C. Hardy and Associates (Formerly Rysdon Products Company), Chicago, Ill.

P. H. Geiger (Deceased), University of Michigan, Ann Arbor, Mich

G. W. Kamperman, Bolt Beranek and Newman, Inc, Downers Grove, Ill.

J. H. Miller, Weston Instrument Corp, Newark, N. J.

A.P.G. Peterson, General Radio Company, Cambridge, Mass.

H. H. Scott, Hermon Hosmer Scott, Inc, Cambridge, Mass.

W. B. Snow, The Bissett-Berman Corp (Formerly self-employed), Santa Monica, Calif

H. A. Thorpe, Lockheed Aircraft Corp (Formerly BuShips representative), Burbank, Calif

P. S. Veneklasen, Western Electro-Acoustic Laboratory, Los Angeles, Calif

R. J. Wells, General Electric Company, Schenectady, N. Y.

Conclusion

THE SOUND LEVEL METER is perhaps the most used instrument in general acoustics. The comprehensive study which has resulted in the revision of the standard has taken over eight years. The long time in preparation reflects the changing requirements in modern noise technology. These influences were so great that there will probably be a steady demand for more improvements. For this reason, the S1 sectional committee has proposed to set up a new committee to study another revision as soon as this document is in print. Thus, the progress which is made in noise measurements can become more rapidly available to the public through up-to-date standards. The committee believes that the new standard is a considerable improvement over the old one and therefore does not require apology. The committee feels that in future revisions many of the limitations and compromises will be eliminated.

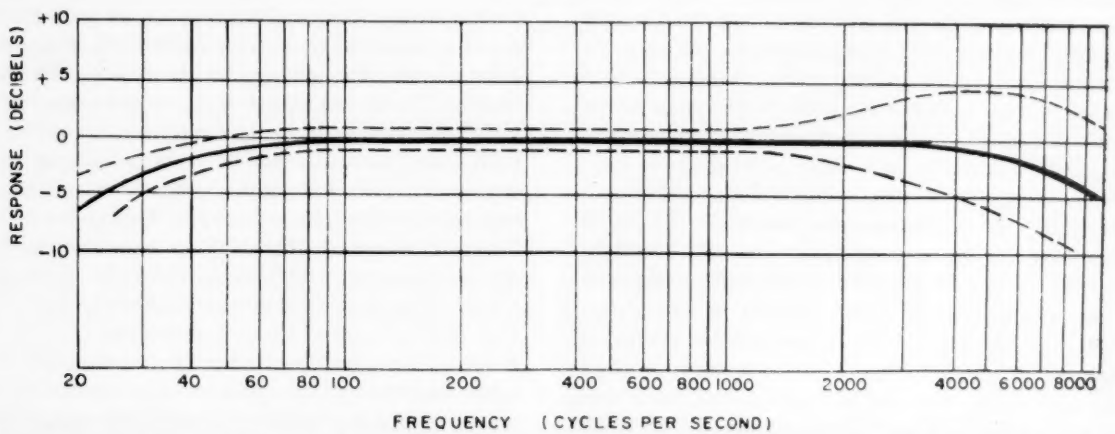


Figure 8. New tolerances for the sound level meter. A and B network tolerances are now referred to C network and are given in Table 1.

The Question Of Symbols

National Standards and International Recommendations

by HAROLD P. WESTMAN

QUITE REASONABLY, we are confused when we find two or more standards issued by different organizations on the same subject, particularly when they are not in complete agreement. The temptation to select the document that has been approved by the largest or oldest group may lead deeper into confusion, for not all such bodies have the same objectives.

If, for instance, we find inconsistencies and even outright conflicts between documents issued by established and responsible national and international standardizing bodies, it is only logical to ask why this situation is permitted to exist; what good does it serve. To answer this, we must understand the purposes of these organizations and the conditions that bring about such divergence of opinions that, even when they know of each others' differences, organizations basically dedicated to cooperation and coordination permit them to remain unreconciled.

As an example, the national standardizing body in the United States of America, the American Standards Association (ASA), provides a procedure for science and industry to declare publicly how certain continuing problems may be handled. Use of these standards is not compulsory and their excellence is what keeps them in service.

On the international scale, we find the International Electrotechnical Commission, an independent body of such status that it has been designated as the electrical branch of the International Organization for Standardization (ISO).

The primary function of the International Electrotechnical Commission is to encourage the standards organizations in all countries to adopt standards that are as nearly alike as their national practices permit. Strictly speaking, IEC issues recommendations to the standardizing bodies in each nation, which then work to bring their national standards in as close accord with the international recommendations as possible. It is not uncommon and there is no disgrace for a member country to issue a standard that differs substantially from the international document. This simply means that the customs, practices, and conditions in that country do not then permit full coordination.

As an example, an important field in which there will probably never be full coordination among all national standards is that of letter symbols for physical quantities. For use in mathematics, each such symbol should be a single letter, and usually the initial letter of the name of the quantity is selected, such as *R* for resistance and *C* for capacitance. If the desired letter has already been used, some variation in the name of the quantity may be resorted to, such as *I* for intensity of current. As there is only a limited number of letters, even after borrowing from the Greek alphabet, purely arbitrary selections become unavoidable.

MR WESTMAN, editor of Electrical Communications, *International Telephone and Telegraph Corporation, New York, is chairman of ASA's Graphic Standards Board.*

A quantity may have different names in various languages, so we may start out with many possible letter symbols for it. Fortunately, English, French, and German seem to be the languages in which a large proportion of the scientific and engineering literature has been published, and their letter symbols have had greatest acceptance. There are still many disagreements, but certainly fewer than if all languages were used equally. The IEC committees, representing all interested countries, work toward the fewest number of alternative symbols with the hope of eliminating all but one at some future time. While awaiting this millenium, a reader can always refer to the international document for the meaning of an unfamiliar letter symbol. This is why these reports are not restricted to the national committees to whom they are primarily addressed.

The present report on letter symbols of the International Electrotechnical Commission was issued in 1953 and is IEC Publication 27, International Letter Symbols Used in Connection with Electricity. The corresponding American Standard is on Letter Symbols for Electrical Quantities, Z10.5-1949. It not only acknowledges the attempts to coordinate with Publication 27 but also makes frequent references in its tables of symbols to the international recommendations where there is a possibility of influencing practice in the United States to bring about further coordination in the future. Both IEC Publication 27 and American Standard Z10.5-1949 are in process of revision at this time with coordination fully in mind to reduce differences to a minimum. Unfortunately, the only principles on which each country can act are the practices and conditions within its borders and, certainly in letter symbols, ultimate agreement throughout the world is possibly as distant as the adoption of a single language for science and engineering.

A field closely related to letter symbols is that of

abbreviations, which has often been divided into two branches, abbreviations for use in text and those for use on drawings. Of course, the letters used for the abbreviation of a given term should be identical whether used in text or on drawings, but the number of abbreviations permitted on drawings is often limited for practical reasons of memory. In contrast, abbreviations used in text may be defined where they are first introduced in a paper, to permit a great many more to be included without taxing the memory of the reader.

MANY EUROPEAN countries use what are called symbolic abbreviations for the units in which various quantities are expressed. They differ in principle from our abbreviations in that the single letter for any unit that is named after a person is capitalized. This gives kW for kilowatt, mA for milliampere, and dB for decibel. Strictly speaking, there are no letter symbols for units but only for quantities and we may assume that the "symbolic" part of the name refers to the way in which the abbreviations have been derived. Perhaps we should not think of "symbolic" in the letter-symbol sense but rather as a general sign to remind us of those early workers who contributed so importantly to our technology. These capital letters then assume the significance of monuments to be usefully employed by the living rather than assembled in a cemetery!

One reason why we have not accepted symbolic abbreviations in the United States is the requirement stated in American Standard Abbreviations for Use on Drawings, Z32.13-1950, that all lettering on drawings be in capitals. An important factor in this decision is that we frequently use photographic means to change the size of drawings. On reduction, the open areas in some letters often fill in, damaging their legibility. Such areas are relatively larger in capitals than in small letters and so suffer less in reduction.

Another reason stems from our use of mechanical aids to produce uniform lettering. It would be quite inconvenient and time consuming to change lettering guides back and forth between capitals and small letters, particularly with the frequency required by symbolic abbreviations.

Although American Standard Abbreviations for Scientific and Engineering Terms, Z10.1-1941, which applies to text, gives no rules for capitalization, in general it conforms to the policy statement in MIL-STD-12B of 18 May 1959 that abbreviations follow the same rules for capitalization as would apply if the full word were used in the same context.

Thus, our practices for both text and drawings make it inconsistent for us to adopt the symbolic abbreviations. Although we will not accept these international recommendations, we recognize the right of other countries to their views. On some subjects, we may agree with the international recommendations to which other countries do not subscribe. The open declaration of these differences does serve a useful purpose, particularly for those who must work with both systems.

LETTER SYMBOLS

Illustrative Comparison of American Standard and International Recommendation

COORDINATED SYMBOLS

Quantity or Name	*Z10.5-1949*	*IEC 27 (1953)*
capacitance	C	C
current	I	I
electromotive force	E	E
electric potential	V	V
potential difference		U *or* V
energy	W	W
frequency	f	f
impedance	Z	Z
power, active	P	P
power, reactive	Q	Q *or* Pq
power, apparent	S	S

SYMBOLS NOT COORDINATED

capacitivity of evacuated space (permittivity used by IEC deprecated in American Standard)	ϵ_0	E_0, ϵ_0
number of poles	p	$2p$
permeance	$\mathcal{P}$ Λ	Λ *or* P
permeability of evacuated space	μ_r	μ_0
reluctance	$\mathcal{R}$	R

ABBREVIATIONS VS SYMBOLS FOR UNITS

Name		Abbreviation of Unit (Z10.1-1941)	Symbols for Unit [IEC 50(05)-1956]
Quantity	Unit		
frequency	cycles per second	spell out unit or c (cps in proposed revision)	c/s
power	watt	w	W
voltage	volt	v	V
quantity of electricity	coulomb	spell out unit	C
capacitance	farad	spell out or f	F
current	ampere	amp	A
resistance	ohm	spell out or Ω	Ω
reactive power	var	var	var

Standards Engineers Society

Honors

"Service to Standardization"

STANDARDS ENGINEERS SOCIETY

A. S. T. M. AWARD

Presented to

Magazine of Standards

CITATION: To a nation and a world having ever-increasing interest in and need for standardization, the existence of a magazine devoted exclusively to news and reports on developments in the field is invaluable. Such a role is being played by the Magazine of Standards.

Through the years, the Magazine, under the able direction of its Editor Miss Ruth E. Mason, has served to keep all interested groups and individuals informed of developments in Standardization on both the United States and International scenes. In this manner, it has served both to demonstrate accomplishments and to stimulate thinking toward the broader objectives of the field. Its educational role thus has been considerable.

Therefore, in appreciation of its contribution to Standardization, the Standards Engineers Society is proud to present to the Magazine of Standards, monthly publication of the American Standards Association, the 1961 STANDARDS ENGINEERS SOCIETY-AMERICAN SOCIETY FOR TESTING MATERIALS AWARD for

Outstanding Contribution
to the
Literature on Standards.

Awarded Sept. 20, 1961

OUTSTANDING SERVICE to standardization in a number of different categories was recognized at the annual meeting of the Standards Engineers Society in Chicago, September 18-20. Theme of the meeting was "Standards Equals Cost Reduction."

For "outstanding service in the interest of standardization," **H. Thomas Hallowell, Jr,** president of Standard Pressed Steel Company, Jenkintown, Pa., received the joint Standards Engineers Society-American Society for Testing and Materials award. Mr Hallowell is a past president of the American Standards Association and is at present an ASA director and member of ASA's Executive Committee. He has been active for many years in the SES and other standards associations and activities.

"The career of H. Thomas Hallowell, Jr, reflects a combination of corporate support for standardization by means of his company programs and of personal managerial support through his active participation in industrial standardization activities," the citation pointed out. "Presentation of this SES-ASTM award affords recognition of his services to standardization and concurs wholeheartedly with the many other awards conferred upon him."

The Standards Engineers Society-American Society for Testing and Materials award for "outstanding contribution to the literature on standards" was presented to THE MAGAZINE OF STANDARDS. "To a nation and a world having ever-increasing interest in and need for standardization, the existence of a magazine devoted exclusively to news and reports on developments in the field is invaluable. Such a role is being played by THE MAGAZINE OF STANDARDS," declared the citation.

Calling attention to the fact that through the years the magazine has served to keep all interested groups and individuals informed of developments in standardization, both in the United States and internationally, the citation declared that the magazine "has served both to demonstrate accomplishments and to stimulate thinking toward the broader objectives of the field." "Its educational role thus has been considerable," it said.

Victor S. Gittens and **Antoine F. Gagne** received the Society's "Special Service Citation for Outstanding Service to the Society." Mr Gittens, engineer specialist, Philco Corporation, Philadelphia, is a charter member, having joined the Society in 1948. He was cited, not only for having provided "the spark necessary to launch the first SES Section in Philadelphia in 1952," but also for "ensuring the financial stability of the Philadelphia Section and the SES." Mr Gittens served as treasurer of the Society for 1954 and 1955 "during the pioneer days when all officers performed multiple functions." Mr Gittens has also served the Society in many other capacities.

Mr Gagne, consulting engineer of Binghamton, N.Y., helped to organize the Southern Tier Section of the Society in 1954 and was its first chairman. "He possesses the unique distinction of having been a member of the SES Board of Directors continuously since

1955," the citation points out. Mr Gagne was also cited for having served as managing editor of *Standards Engineering* from 1957 to 1959, and for "placing the magazine on a firm editorial and business footing."

A number of men who have played an important part in the work of the American Standards Association as well as in the Standards Engineers Society were elected Fellows of the Society this year. **Samuel H. Watson, Arthur E. Pringle, II, Herbert G. Arlt,** and **J. Robert Walgren,** all well known in ASA work, are the new SES Fellows.

Mr Watson, who was elected a Fellow "for his outstanding contributions in furthering the cause of standardization," has been active in standards work since 1930, and has been manager of corporate standards for the Radio Corporation of America for the past 17 years. "During this period, in addition to directing the corporation's standardization program, he has been responsible for encouraging active participation of his company's personnel in standardization committee activities of professional societies and trade associations on both an industrial and national level," the citation points out. "As a member of the Company Member Conference of the American Standards Association since its inception, and as its chairman for several years, he has played a key role in developing that organization. This has resulted in broader dissemination of information to the standards engineering profession."

Mr Pringle was named a Fellow of SES "in recognition of his important accomplishments in standardization."

"With an active interest in standardization for more than thirty years, during which time he has served as a member or chairman of many industrial, national, and international standardizing bodies, he has continually proved to be a leader in the development of policies and procedures essential to the orderly development of industry and safety standards," the citation states.

"His standardization activities as a member, and in many cases as an officer, include: the National Electrical Manufacturers Association, the American Institute of Electrical Engineers, the National Fire Protection Association, and the American Standards Association.

"As president of the Pringle Electrical Manufacturing Company, he is exemplary proof of the fact that dynamic support and participation in standardization is both practical and productive for industrial companies."

Mr Arlt, materials specification engineer, Bell Telephone Laboratories, Murray Hill, N.J., was cited as "an active leader in company, professional society, and trade association standardizing bodies for many years," where "he has contributed generously of his time and experience to further both standards and standardization." Mr Arlt has been active in various committees of the American Society for Testing and Materials and has also contributed substantially to American Standards Association activities in committees, in the Miscellaneous Standards Board, and in the Company Member Conference. "During his term as president of the Standards Engineers Society, he was responsible for the renewed vitality of the Society, and his continuing long-range planning is of incalculable value in enabling the Society to provide increasing service to standards engineers," the citation declared. "In his work on materials and methods standardization in the Bell Telephone Laboratories, he has seen many of his efforts find broad acceptance and recognition as efficient and economic advances."

Of **Mr Walgren's** "important accomplishments in standardization," his fellowship citation states: "As a long-time member of the Company Member Conference of the American Standards Association, and its past chairman, and as the organizer of the Pittsburgh Section of the Standards Engineers Society, he has contributed greatly to the recognition of standardization as a tool to relieve the shortage of technical manpower. In his position as supervisor of the Engineering Standards Section of the Aluminum Company of America, and in his many lectures and written articles he has been, and continues to be, an outstanding champion of standardization."

THE Standards Engineers Society now has 1,139 members, located in 14 countries, **H. R. Terhune,** president of the Society, reported. The majority of these members are active in 17 local sections, 14 of which are in the United States, two in Canada, and one in England. "In the very near future we expect to announce a new section in Sweden and others in the United States," Mr Terhune said.

He pointed out that the goal of the Society for the future is to increase membership and finances to a point where it will be possible to "increase services to the membership through an expanded, headquarters staff." He also recommended regional meetings of one or two days' duration, conducted by two or more adjacent sections. Calling attention to the fact that the Society's constitution expressly excludes the development or issuance of standards by the Society, he commented that the members would, he was sure, continue to support the standards issued by "the respective trade associations, by the military, and by our big brother, the American Standards Association." Concerning the constitutional objective, "To encourage, through suitable awards, scholarships and grants, significant additions to the literature of standardization and its formal study, including research, in appropriate institutions of learning," Mr Terhune commented that this is one of the Society's more important objectives. It includes the establishment, in schools and colleges, of courses in standardization and thereby implies the creation of a degree in standards engineering. The establishment of such courses is progressing slowly and must be given a vigorous push, he said.

Continued expansion in the international area is another objective. "While attending European meetings of the International Electrotechnical Commission, I have been deeply impressed, not only by the high degree of competence of the European and Asian delegates, but also by their extreme willingness to ignore political differences and cooperate with each other and with us in the establishment of sound international technical standards," he said.

W. M. Berg, president of the PIC Design Corporation, Long Island, N. Y., presented the keynote address, "Standardization Reduces Cost." He pointed out that progress in the development of precision parts is dependent on the development of proper standards, and used the work of the American Gear Manufacturers Association and the Anti-Friction Bearing Engineers Committee as examples of what has been accomplished by standardization. Stock gears are available with a variety of types of hubs and are made of such materials as stainless steel, aluminum, bronze, nylon, and linen phenolic, he said. Pitches of 24, 32, 48, 64, 72, 80, 96, 120, and 200 are standard, with a 20-degree pressure angle.

Among other precise mechanical parts which have become standard items, Mr Berg mentioned Oldham-Bellows and sleeve couplings, engraved drum and disc dials, bevel gear differentials, worm and wheel reduction units, and speed-reduction units ranging from a 3:1 to a 10,000:1 ratio. Application of standard components such as these ensures precise equipment at minimum cost, he said.

Not all management levels need convincing of the need for standardization, said **Irving Wilshinsky** in his talk, "Convincing Management of the Need for Standardization." Mr Wilshinsky is manager, Allied Standards, International Business Machines Corporation. The executive levels often realize the need for standardization but must be advised as to the extent, he said. This advice must come from the lower levels of management—middle and first-line management. Therefore, this is the management group that must be convinced of the need for standardization. The methods and considerations involved in selling standardization must aim to keep management convinced so that no costly lapse or backsliding of standardization efforts retards its program, Mr Wilshinsky declared.

In the panel on specifications, with **R. F. Franciose,** General Electric Company, Schenectady, as chairman, **Ellsworth F. Seaman** described the work being done under contract with the Bureau of Ships by the American Standards Association. **Paul Durr,** Wright Patterson Air Force Base, Dayton, Ohio, discussed Procurement Document MCP 71-77, and **Douglas S. Price,** supervisor, Specifications Section, Melpar, Inc, Falls Church, Virginia, presented a discussion of the findings of an ad hoc committee of the National Security Industrial Association.

Interesting discussions were presented on the subject of purchasing, with **W. P. Kliment,** Crane Company, Chicago, as session chairman. On the subject "A Purchasing Agent Looks at the Standards Engineer," **R. M. Thompson,** director of purchases, Automatic Transportation Company, Chicago, said that the application of standards and standardization is limited only by the capabilities and interest of those charged with this responsibility. Successful programs will overcome the bottlenecks of indifference, heavy workloads, and personal and departmental jealousies.

A good standards engineer is ready and willing to give credit to others, even if not fully earned, to create interest and increase positive action in his desired program, he said, and commented that the increasing use of data processing equipment makes standardization even more imperative. The standards engineer should be on the threshold of increased recognition and corporate status, in Mr Thompson's opinion.

Richard B. Berry, deputy purchasing agent of the City of Chicago, asked the question, "When Does Standardization Cost Money?" and answered it by commenting that unfortunately standards are not timeless. Under tomorrow's economic conditions, the markets of basic materials, technological advances, and customer demands may erode what was a good decision yesterday, he pointed out.

In many cases, standardization produces an area of self-satisfaction and security, Mr Berry said. Pressed with many problems, one moves on to other areas and may leave behind the original problem in the belief that it is well solved, secure, and standardized.

The disadvantages of standardization must be compared with its advantages if a positive, helpful solution to a given company problem is to be reached, Mr Berry pointed out. Further, standards must constantly be on trial because their effectiveness can wane rapidly. Standardization should not stifle inventiveness, ingenuity, and the appeal of a product or service.

The high price of delay was the subject discussed by **Roy P. Trowbridge,** director of engineering standards, General Motors Corporation, Detroit.

A panel on value analysis was the last technical session of the meeting. **W. L. Healy** answered the question "Value Analysis—What Is It?" by explaining that it is a system of techniques and planned methods that goes far beyond any cost reduction program. It is a philosophy, he explained, a way of life, in which the individual learns to look objectively and with imagination at an object, a material, an operation, or a service, and learns to compare the cost of all these things with the function performed.

This explanation was followed by a paper on "Value Analysis and Cost Reduction" by **Kenneth Bockman,** assistant chief engineer, Communications Division, Motorola, Inc, Chicago.

The banquet address, "An Engineer Looks at Creativity" was presented by **Thomas A. Abbott,** manager, Engineering Administration, American Oil Company.

CROSS - INDEXING

Industry and Military Specifications and Standards

Reported by W. L. HEALY

Do you know of any case where an adequate, and comparable, industry standard or specification can be used for a military document? If so, you are invited to call it to the attention of W. L. Healy, staff engineer, American Standards Association. Mr Healy is cross-indexing and analyzing comparable industry and military specifications for the Bureau of Ships under a contract with ASA.

It is the thought that the materials represented by the industry standard are the standard, and more readily procured, materials. It is hoped that these industry standards and specifications which have been listed along with their comparable military documents in THE MAGAZINE OF STANDARDS may be used for procurement. However, the use for procurement of any of the published industry standards or specifications, especially in the area of critical application, is a matter for decision by the cognizant engineering office.

Following are recent examples of work performed under the contract. For other examples, see THE MAGAZINE OF STANDARDS, each issue beginning February 1961.

MIL-T-16286B (SHIPS)
cross index ASTM A 210-60T

MIL-T-16286B (SHIPS)—TUBES, STEEL SEAMLESS, MARINE BOILER APPLICATION

Equivalent Areas: ASTM A 210-60T, covering seamless steel boiler tubes and boiler flues and superheater tubes, is equivalent to MIL-T-16286B (SHIPS), class g. The physical properties requirements are identical. The mechanical properties requirements are comparable but vary slightly. They are as follows:

	C	Mn	S1	P	S
ASTM A 210-60T	0.27	0.93	0.10	0.058	0.048
MIL-T-16286B (SHIPS) Classes b and g	0.27	0.80	0.10	0.04	0.045

Both specifications provide that tubes be made from billets of killed open hearth or electric furnace steel. Both specifications include tests for tension, and hydrostatic, and for flattening and flaring.

Divergent Areas: ASTM A 210-60T requires a Brinell Hardness test. This test is not specifically called for in MIL-T-16286B (SHIPS).

The military specification provides that one specimen for tension testing shall be taken from each of two tubes selected from each lot of tubes, class g, and the test specimen shall be subjected to the tension test. One coupon for each of the required flanging, flaring, and flattening tests shall be taken from each end of each tube as rolled. The ASTM specification provides that samples for tension testing shall be taken from two tubes selected at random from each group of 100 finished tubes. The tubes used for flaring and flattening tests will be selected at random.

From each lot of finished tubes heat treated in batch-type furnace the flattening tests will be made on each end of one tube and the flaring test on each end of the other tube. The permissible variations in dimensions vary slightly as follows:

Outside diameter in inches	MIL-T-16286B (SHIPS) class g		ASTM A 201-60T	
	+	—	+	—
up to 1¼" incl	0.005	0.010		
over 1¼" to 2" incl	0.005	0.015	1/64	1/32
over 2" to 4" incl	0.016	0.031		
over 4"	0.016	0.047	1/64	3/64

The total permissible variation in length is the same for both specifications (ed) plus 3/16 minus 0.

Exclusions: The ASTM A 210-60T does not cover MIL-T-16286B (SHIPS) classes A, C, D, E, and F.

Additional Information: The procurement document should specify the ordering data and include sampling and inspection requirements as indicated in MIL-T-16286B (SHIPS). Preparation for delivery shall be in accordance with MIL-C-16173.

Domestic shipment should be in accordance with Jan-B-121, type 1. Overseas shipment should be in accordance with Jan-B-121, grade A and types G2C and G3C, specification Jan-P-125, or tubes may be packed in crates conforming to specifications PPP-B-60 (OVER-SEAS TYPE) Jan-P-106 or style C Jan-P-132.

Marking for identification of tubes: Each end of each tube 1¼ in. O.D. and over and 3 ft or more in length should be legibly marked by paint stenciling. The identification should include name or trademark of manufacturer, heat number, class number, specification number, outside diameter, wall thickness, and length.

MIL-S-871B (NAVY)
cross index ASTM A 204-57 *(SAE SA 204) (ASA G34.1-1958)* ASTM A 302-56 *(SAE SA 302)*

MIL-S-871B (NAVY)—STEEL PLATES, CARBON-MOLYBDENUM ALLOY AND MANGANESE-MOLYBDENUM ALLOY, HOT ROLLED.

Equivalent Areas: ASTM A 204-57, grade B, (SA 204 and ASA G34.1-1958), is equivalent to MIL-S-871B (NAVY) class 1.

The chemical and physical properties requirements are equivalent.

ASTM A 302-56, grade B, (SA 302), is equivalent to MIL-S-871B (NAVY), Class 2.

The chemical and physical properties requirements are the same except that the range of Mn in the military specifications is 1.10–1.50% and Mo is 0.4–0.60% and the ASTM is 1.15–1.50% and 0.45–0.60% respectively. Also, the ASTM specification permits a max of 0.04% P and 0.05% S for flanging quality and 0.035% P and 0.04% S for firebox quality while the military specification permits a max of 0.035% P and 0.04% S for both flange and firebox qualities. Both specifications require that the plates be made from ingots or slabs which have been made by open hearth or electric furnace process. MIL-S-871B (NAVY), class 1, and ASTM A 204-57 both provide that plates over 2 in. thick, unless otherwise specified, shall be normalized for grain refinement.

Both specifications provide that plates 2 in. thick and less will be supplied in the as-rolled condition unless otherwise specified. They may be furnished stress relieved, normalized, or normalized and stress relieved.

MIL-S-871B (NAVY), class 1, specifying two tension, one bend, and one homogeneity test from each plate as rolled, is for firebox and flange quality. ASTM A 204-57 specifies the same tests for each plate of firebox steel but only one tension and one bend test on each plate as rolled of flange quality.

Divergent Areas: ASTM A 204-57 is limited to 2 in. thick flanging quality steel and 6 in. thick firebox. ASTM A 302-56 is limited to 2 in. thick flanging quality steel and 4 in. firebox. MIL-S-871B (NAVY), class 2, specifically calls for impact (V-Notch Charpy-type test), and microexamination for grain size by McQuaid-Ehn test. Class 2 specifies a number 5 to number 8 austenitic grain size. ASTM A 302-56 does not call for either the Charpy test nor the McQuaid-Ehn test.

MIL-S-871B (NAVY) specifically requires that plates 5/8 in. thick and over, when used for pressure parts of boiler, be sand blasted.

ASTM A 204-57 and A 302-56 do not have this requirement.

Exclusions: None.

Other Requirements: The procurement document should specify the ordering data and include sampling and inspection requirements as indicated in military specification MIL-S-871B (NAVY).

The plates to be prepared for shipping domestic, storage, and overseas in accordance with MIL STD No. 163.

Marking for shipment should be in accordance with MIL STD No. 163.

MIL-S-16113B (NAVY)
cross index ASTM A 131-59

MIL-S-16113B (NAVY)—STEEL PLATE, HULL AND ORDNANCE, STRUCTURE, BLACK (UNCOATED) AND ZINC-COATED (GALVANIZED)

Equivalent Areas: ASTM A 131-59, grades B and C, are equivalent to MIL-S-16113B (NAVY), grades M and M class a, respectively. The chemical and physical properties requirements are equivalent.

Plates ½ in. to 1 in., inclusive, in thickness should conform to requirements of grade B. Plates 1 in. to 2 in., inclusive, in thickness should conform to the requirements of grade C. Both specifications provide that steels 7/8 in. thick and over be made using fine grain practice. Military specification MIL-S-16113B (NAVY) grade M class a, and ASTM A 131-59 grade C both provide for silicon killed steel.

Divergent Areas: MIL-S-16113B (NAVY) provides all plates be made from ingots or slabs produced from open hearth or electric furnace while ASTM A 131-59 permits ingots from open hearth, basic oxygen, or electric furnace.

The table below shows the chemical properties requirements for both specifications:

	MIL-S-16113B (NAVY)		ASTM A 131-59	
	grade M	class a grade M	grade B	grade C
C	0.26-0.31	0.26-0.31	0.21-0.25	0.24-0.28
M	0.60-0.90	0.60-0.90	0.80-1.10	0.60-0.90
P	0.045	0.045	0.04	0.04
S	0.055	0.055	0.05	0.05
Si	———	0.15-0.30	———	0.15-0.30
Cu	0.35	0.35	———	———
Ni	0.25	0.25	———	———

The military specification MIL-S-16113B (NAVY) specifically prohibits the repair welding of plate surfaces and edges. ASTM A 131-59 (ASTM A 6-60T) permits welding with certain limitations.

Military specification MIL-S-16113B (NAVY) grade M requires that plates 7/8 in. thick and over be normalized by heating to 1650±25 F holding a minimum of 30 minutes per inch thickness and individually cooling in air, (not required by ASTM A 131-59).

Exclusions: ASTM A 131-59 does not include MIL-S-16113B (NAVY) type 1, grades HT and HT class a, and type II, all grades of zinc-coated (galvanized). ASTM A 131-59 does not include material over 2 in. thick.

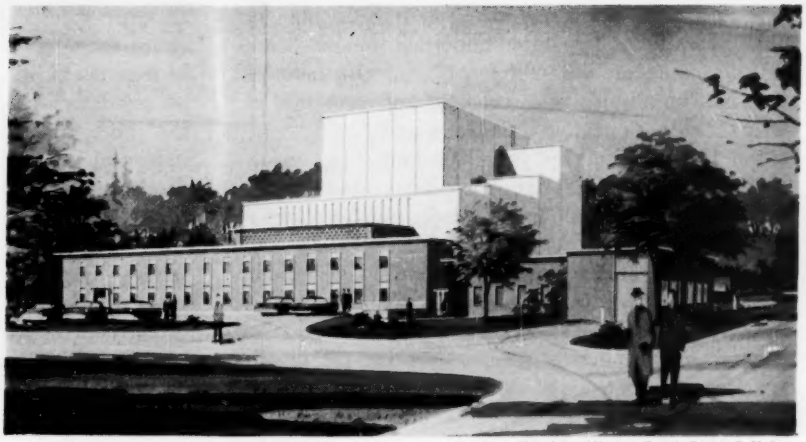
Other Requirements: The procurement document should specify the ordering data and include sampling and inspection requirements as indicated in MIL-S-16113B (NAVY).

Special Markings: Each plate 1/4 in. thick or more should be steel-die stamped with heat, plate, and slab number in letters at least 1/4 in. high. Each plate less than 1/4 in. thick should be steel-die stamped or stenciled with heat or slab number. When plate or slab number is used in lieu of "heat number," the plate or slab number shall provide such information as will enable government inspectors to identify the heat. The heat, plate, or slab number, the grade or grade and class, designation, and the inspection stamp should be located in one corner of plate not more than 12 in. from either side. It should be encircled with white paint. Plates passed magnetic inspection should be marked with letters at least 6 in. high.

In addition to any special markings required by contract or order, shipments should be marked in accordance with MIL STD 163.

For domestic shipment and storage or overseas shipment, steel plates should be prepared for shipment in accordance with MIL STD 163.

New Headquarters Started for National Bureau of Standards



courtesy: Voorhees Walker Smith Smith & Haines

The Engineering Mechanics Laboratory, first building started at the Bureau's new site.

THE NATIONAL BUREAU OF STANDARDS, the custodian for the country's fundamental measurement standards and center for research on the application of measurement standards, is to have a new headquarters in keeping with its expanding responsibilities. On June 14, Secretary of Commerce Luther H. Hodges broke ground for the new laboratories for the Bureau at Gaithersburg, Maryland. When completed, the new center will have 20 buildings, permitting the complete relocation of the Bureau from Northwest Washington to the 555-acre site in Montgomery County.

"At no time in our history have the measurement needs of the country been greater," Secretary Hodges stated in remarks prepared for delivery at the groundbreaking ceremony. "The exploration of outer space, the growth of nuclear technology, the requirements of national defense, the rapid application of scientific developments to civilian technology, all of these factors point to a future in which the science of measurement will play an increasingly vital role. With the most modern facilities, the scientists and engineers of the National Bureau of Standards will wage the fight to keep the nation's measurement competence abreast of the pressing demands of science and technology."

The ground breaking took place on the site for a high-priority facility, an Engineering Mechanics Laboratory. This building will house a one million pound dead-weight machine which will enable the Bureau to provide urgently needed force measurement standards to meet the multimillion pound thrust requirements of the space program. The initial construction phase, in addition to the Engineering Mechanics Laboratory, calls for a boiler plant and site development.

For several years, the Bureau's vital services to national defense, science, and industrial technology have been hampered by inadequate and outmoded research facilities. Space for further expansion is lacking on the present site. Also, many of the buildings on the present site are temporary, and even the permanent buildings are outmoded. Renovation and modernization would be costly, amounting to more than half the estimated cost of a complete new facility. In addition, some of the laboratories contemplated could not be built in an urban site such as the Bureau's present location in Washington.

Congress has so far appropriated $27 million to finance the relocation of the Bureau. Estimates of the total cost of the program are in the range of $104 million. Funds for the later construction phases have not yet been provided, but plans call for a continuing construction program leading to accommodations for total relocation in the period between 1963 and 1965. Later work will include construction of a Radiation Physics Laboratory (including a linear accelerator), seven modern interconnecting general purpose laboratory buildings, a number of additional special purpose laboratories, and an atomic reactor.

Equipment for the boiler plant is part of the present contract and will include steam-heating facilities for the entire Bureau and four 3000-horsepower refrigerating units to provide chilled water for laboratory purposes and air conditioning.

In addition to the million pound dead-weight machine, the Engineering Mechanics Laboratory will contain a gravity chamber, other dead-weight testing machines of 100,000 pounds and 300,000 pounds capacity, a vertical tension and compression testing machine capable of loads up to 10 million pounds, and an Emery horizontal testing machine with a capacity of 2,300,000 pound loads in compression and 1.5 million pound loads in tension.

Although under the Department of Commerce since 1903, the National Bureau of Standards was originally organized as part of the Treasury Department in 1901. It celebrated its sixtieth anniversary on March 3rd this year.

THE CUSTODIAN of the national standards of physical measurement, the Bureau was established with the express mission of providing within the United States a complete and consistent system of physical measure-

ment and of coordinating this system with those of other nations. Its two most important functions are (1) development and maintenance of the national standards of physical measurement and provision of means for their effective utilization, and (2) determination of fundamental physical constants (e.g., velocity of light) and the basic properties of materials. Other functions include the development of test methods, cooperation in the establishment of codes and specifications, and assistance to other Government agencies on technical problems. To fulfill these functions, the Bureau must conduct a broad program of research in the physical sciences, seeking continually to advance the science of measurement in all fields, to refine continually and improve existing standards and to develop new ones, to develop improved instrumentation and objective methods of test, and to evolve techniques for transferring measurement accuracy to the various scientific and industrial organizations within the country.

None of the complex products such as refrigerators, television, or cars, which are taken for granted as necessities of comfortable day-to-day living, would be available at the present relatively low prices were it not for the existence of the Bureau to provide and put into practical effect a central system of measurement. Besides the basic elements of this system—standards of mass, length, temperature, and time—measurement also includes an accurate knowledge of the composition of materials. Accordingly, the Bureau produces standard samples which in defining the composition of materials also ensure quality control of industrial products. These samples are used to control the quality of steel and define the color of paints, for example, and to delineate the accuracy of calibration devices employed by industry to control the production of such items as synthetic rubbers and motor fuels —over 600 materials are now included in the NBS list of standard samples.

To carry out its varied work, the Bureau maintains a staff of about 3,000 at Washington. Over half this number are scientific personnel belonging to one of 15 basic technical divisions which cover almost the entire range of the physical sciences. However, the Bureau is essentially a research organization and has no regulatory powers; nor does it actually formulate the codes and specifications governing scientific and industrial practice. Its function in this respect is to cooperate with the appropriate bodies—with the Federal Government, with State and local governments, with professional societies and other standardizing bodies—by providing them with the necessary technical assistance and data as required. To the State Governments, especially through the medium of the National Conference of Weights and Measures, the Bureau offers technical assistance in the sphere of commercial weighing and also calibrates and adjusts State standards. During the past year, Bureau staff members sat on the committees of 137 professional and standardizing bodies such as the American Society for Testing and Materials, the American Standards Association, the American Society of Mechanical Engineers, and the American Chemical Society. Another means of cooperation with industry is the Bureau's Research Associate Plan and the Donor Program, under which outside organizations can sponsor special research at the Bureau's premises and so make use of its unique facilities.

It is by these methods that the results of the Bureau's work are given direct application in the current problems of science and industry, especially those concerned with measurement standards, building and safety codes, engineering and purchase specifications and test methods. On an international level, the Bureau represents the interests of this country abroad by participating with its foreign counterparts in such groups as the International Union of Pure and Applied Chemistry, the International Union of Pure and Applied Physics, the International Organization for Standardization and the International Conference on Weights and Measures, which only in October of 1960 adopted a new international standard of length—the wave length of the orange-red line of Krypton 86—to replace the 70-year old international meter bar.

NEW INTERNATIONAL RECOMMENDATIONS

ISO Recommendations are published by the International Organization for Standardization, and IEC Publications by the International Electrotechnical Commission, Geneva, Switzerland. Copies are available from ASA.

DETERMINATION OF FORMS OF SULPHUR IN COAL. ISO R 157. June 1960. First edition. $2.40

This Recommendation contains alternative methods for determining the form of sulfate sulfur in coal (gravimetric and titrimetric methods) and alternative methods for determining the form of pyritic sulfur in coal (oxidation and reduction methods).

DETERMINATION OF FLEXURAL PROPERTIES OF RIGID PLASTICS. ISO R 178. February 1961. First edition. $1.50

This method of test is for the determination of flexural properties in order to get a measure of the resistance in flexure not only of test specimens having standard dimensions but also of test specimens having other than standard dimensions.

DETERMINATION OF THE CHARPY IMPACT RESISTANCE OF RIGID PLASTICS (CHARPY IMPACT FLEXURAL TEST). ISO R 179. February 1961. First edition. $2.20

The test specified in this document is applied to specimens prepared from molding materials or taken from moldings (including laminates), and is intended particularly for control of production and manufacture, as well as for inspection and acceptance.

DETERMINATION OF THE IZOD IMPACT RESISTANCE OF RIGID PLASTICS (IZOD IMPACT FLEXURAL TESTS). ISO R 180. February 1961. First edition. $1.80

The two methods of test described in this ISO Recommendation are intended to determine the relative sensitivity to fracture by shock of rigid plastics, as indicated by the energy expended by a standard pendulum-type impact ma-

chine in breaking, in one blow, a standard Izod (Cantilever beam) specimen.

METHOD OF SAMPLING PAPER FOR TESTING. ISO R 186. February 1961. First edition. $1.20

Specifies a method of obtaining a representative sample of a lot of paper for test purposes. It applies in general only to paper of a substance below 250 g/m^2.

METHOD FOR THE CONDITIONING OF PAPER AND BOARD TEST SAMPLES. ISO R 187. February 1961. First edition. $.90

Defines the conditioning atmosphere and the method of conditioning paper and board before and during testing. This Recommendation applies to all papers and boards.

RULES FOR ELECTRIC TRACTION MOTORS. IEC Publication 48. 1961. Fourth edition. $3.20.

The principal difference between this fourth edition of Publication 48 and previous editions lies in its extension of coverage to compound-wound motors and motors supplied with pulsating current. The specification applies to traction motors for tramways, railways, trolleybuses, and electrobuses. It does not apply to motors for underground mining locomotives, except by special agreement between manufacturer and user, nor to the motors of thermoelectric vehicles.

The sections include definitions, temperature-rise tests, over-speed tests, starting tests, commutation tests, dielectric tests, determination of characteristic curves, and supply voltages of traction systems.

DIMENSIONS OF ELECTRONIC TUBES AND VALVES. Third supplement to IEC Publication 67, 1958. $2.40.

This is an English-Russian edition of an IEC Publication issued earlier in a French-English edition. It gives standard dimensions for electronic tube and valve bases, including their tolerances and gages. The authoritative comparison of English and Russian electronic terminology given in this standard should prove helpful to translators of Russian technical documents.

CHARACTERISTIC IMPEDANCES AND DIMENSIONS OF RADIO-FREQUENCY COAXIAL CABLES. IEC Publication 78. 1961. Second edition. $1.20.

Recommends rated characteristic impedances and associated dimensions over the dielectric for radio-frequency cables. The new edition differs from the first in that it is no longer limited to coaxial cables with a dielectric of solid polyethylene.

TUBULAR FLUORESCENT LAMPS FOR GENERAL LIGHTING SERVICE. IEC Publication 81. 1961. Second edition. $6.00.

This document applies to alternating-current tubular fluorescent lamps with preheated cathodes for general lighting service, operated with or without a starter. It includes the technical requirements with which lamps shall comply and the testing methods to be used for checking quality and interchangeability either for individual lamp batches or for a manufacturer's entire production.

RECOMMENDATIONS FOR SOUND LEVEL METERS. IEC Publication 123. 1961. First edition. $3.20.

This document contains recommendations for a general-purpose sound level meter intended for ordinary use. Recommendations for precision sound level meters will be issued in a separate edition. Measurements are to be made in terms of three arbitrary weighting curves, with respect to a reference pressure of 2×10^{-5} N/m^2.

The publication covers definitions of terms; sections on microphone and general technical characteristics; characteristics of the indicating instrument and amplifier; and calibration, checking, and marking of the sound level meter.

IEC REFERENCE COUPLER FOR THE MEASUREMENT OF HEARING AIDS USING EARPHONES COUPLED TO THE EAR BY MEANS OF EAR INSERTS. IEC Publication 126. First edition. 1961. $1.60.

Although the coupler described does not provide means for determining the actual performance of a hearing aid on a person, it does offer a simple and ready means for exchange of specifications and of physical data on hearing aids. The coupler is used for loading earphones with a specified acoustic impedance when determining the physical performance characteristics in the frequency range 200-5,000 c/z (Hz). This applies to earphones of air-conduction hearing aids that use earphones coupled to the ear by means of ear inserts.

The construction of the coupler is illustrated by dimensioned drawings.

DIMENSIONS FOR POT-CORES MADE OF FERROMAGNETIC OXIDES. IEC Publication 133. First edition. 1961. $1.20.

Gives those dimensions and tolerances that are essential for ensuring interchangeability. Recommendations for the dimensions of associated parts are still under consideration and are not covered in this edition.

PRINCIPLES OF OPERATION OF STANDARDS MARKS. ISO R 189. March 1961. First edition. $0.60.

The ISO here sets down as official policy the principles that should guide a national standards body in handling a program under which products are labeled to certify compliance with national standards.

SPECIFICATION FOR C.I.S.P.R. RADIO INTERFERENCE MEASURING APPARATUS FOR THE FREQUENCY RANGE 0.15 Mc/s to 30 Mc/s. C.I.S.P.R. Publication 1. 1961. First edition. Published by the International Special Committee on Radio Interference of the IEC. $4.80

SPECIFICATION FOR C.I.S.P.R. RADIO INTERFERENCE MEASURING APPARATUS FOR THE FREQUENCY RANGE 25 Mc/s to 300 Mc/s. C.I.S.P.R. Publication 2. 1961. First edition. Published by the International Special Committee on Radio Interference of the IEC. $4.80

These specifications stipulate performance requirements for radio interference measuring apparatus including the associated standard artificial-mains network. They also specify the requirements that have to be met in the measurement of noise voltages at the terminals of interference-producing apparatus and in the measurement of noise fields from such apparatus.

The specifications are each divided into four parts as follows: Part I: Measuring set; Part II: Measurement of radio-noise voltages; Part III: Measurement of radiated radio noise; and Part IV: Methods of measurement of various types of interference-producing apparatus.

. . . Questions

Which American Standard gives the standard mark to be used on drawings to indicate the surface finish? Do other countries have a similar standard mark?

This mark is contained in the American Standard on Surface Roughness, Waviness, and Lay, B46.1-1955.

The symbol used on British drawings to indicate finish is similar to that used in the United States. In both France and Germany, the finish symbol is a triangle with the apex touching the surface to be finished. The degree of finish is indicated by the number of triangles.

The NEMA standard on power switchgear assemblies calls for the use of Indoor Light Gray No. 61 or Outdoor Dark Gray No. 24. How do these colors compare with the colors recommended in the American Standard Gray Finishes for Industrial Apparatus, Z55.1-1950 (R1959)?

The indoor light gray and the outdoor dark gray specified in the NEMA standard are identical to the light gray No. 61 and the dark gray No. 24 specified in the American Standard. Both standards give the light gray No. 61 as Munsell Notation 8.305.10/0.54 and the dark gray No. 24 as Munsell Notation 10B 2.40/1.18.

Are These Cases Work Injuries?

This is the forty-third installment in the current series of rulings as to whether unusual industrial injury cases are to be counted as "work injuries" under the provisions of American Standard Method of Recording and Measuring Work Injury Experience, Z16.1-1954. (Reaffirmed 1959). The numbers in parentheses refer to those paragraphs in the standard to which the cases most closely apply. Decisions on unusual industrial injury cases are issued periodically by the Z16 Committee on Interpretations. Reprints of each double page of cases published in THE MAGAZINE OF STANDARDS can be obtained in quantity from the American Standards Association at $1.50 per 50 copies.

Sectional Committee Z16 is sponsored by the National Safety Council and the Accident Prevention Department of the Association of Casualty and Surety Companies.

INDEX TO CASES 400-800. An index to Cases 400-800 has now been completed. Arranged numerically by the number of the applicable paragraph of American Standard Z16.1-1954 (R1959) the index includes the number of the case indexed and a key letter indicating what the decision was in each case. Each index reference includes a brief description of the case.

Reprints of Cases 400-800, with the index, are now available from ASA at $2.50. Discounts for quantity orders may be obtained on request.

CASE 875 (1.6; 5.3)

While a secretary was sitting at her desk typing, a sound attracted her attention. She looked up suddenly to see what caused the noise, and immediately developed a severe kink in her neck and left shoulder. While she probably looked up faster than normal, no exceptionally fast or jerky movement was recalled The employee had a history of sore and stiff neck and shoulder muscles in connection with colds, drafts, and sudden movements. The company doctor believed that a touch of neuritis or arthritis may have been present. The employee felt that she may have been coming down with a cold two days before the incident, but felt that the cold appeared to be gone on the day of the incident.

Decision: This should be considered an industrial injury and included in the work injury rates in accordance with the ultimate extent of disability. The committee believed that the employee's sudden movements had arisen out of and in the course of employment and had aggravated a pre-existing physical deficiency.

CASE 876 (1.6)

An appliance serviceman called at a customer's home in response to a request for service. When the customer opened the door, he told the employee that he was six months late and hoped he would correct a condition which had not been corrected by previous servicemen. The customer had been drinking and used abusive language directed at the employee as he started to service the appliance. The employee, noting that the situation was deteriorating, picked up his tools and suggested that he come back later. As he opened the door to leave, the customer kicked him, causing him to half fall and half jump down the steps. After some discussion, the customer attacked him again, kicking him in the groin. This unprovoked assault on the employee resulted in contusions in the lower back and scrotum.

Decision: The committee concluded that the injury arose out of and in the course of employment and that it should be considered an industrial injury and included in the work injury rates, in accordance with the ultimate extent of disability. The committee called particular attention to the statement in the introduction of the Z16.1 standard: "The fact that the employee or employer did not have control over the cause of a work injury shall not be a criterion for excluding the work injury from application of the provisions of this standard."

CASE 877 (1.6; 5.6)

A member of the bricklaying department crew was assigned to assist an air-hoist operator dump a loaded dirt box into a hopper box in connection with a cleanup operation. The loaded hopper box was then picked up by a fork-lift truck and emptied into a waiting truck. The operator of the fork-lift truck then placed the box on the floor near where the air-hoist operator and employee in question were working. The fork-lift truck operator then proceeded to obtain a drink of water at a distance of 15 ft from the vehicle. While the operator was so engaged, the employee in question boarded the fork-lift truck. The air-hoist operator warned him emphatically to get out of the vehicle and that he had no business there. At this point, the machine moved in a reverse motion. Shortly, the employee called out, "I can't stop it!" The fork-lift truck operator, hearing this call and seeing the machine in motion, ran to it and, hanging on the side of it, attempted to get the machine out of gear or set the brakes. He was unsuccessful, and the machine continued in re-

verse a total distance of about 35 ft, passing under a horizontal 8 ft x 8 ft H-beam about 5 ft 1 in. off the cellar floor. The employee was crushed between this beam and the steering wheel and column.

The employee knew, through safety code books, job instruction, and specific direction of supervision, that only authorized personnel were permitted to operate fork-lift trucks, and that such persons received special training, had to meet physical requirements, and had to pass a test before being so authorized. The employee was not an operator nor had he applied for any special training.

Decision: This should be considered an industrial fatality with a time charge of 6,000 days. The committee believed that this fatality arose out of and in the course of employment, in that it resulted from the environment of the employment and its occurrence was not effectively guarded against. This case appeared to be similar to Case 795.

CASE 878 (5.2)

Borderline case. The committee agreed this should not be used as a precedent for future rulings.

CASE 879 (5.15)

An instrument technician was suffering from a mild dermatitis of the hands and feet and was sent by his company to a dermatologist in local private practice. The employee had noted this skin eruption on and off for several years. Upon examination on May 20, the dermatologist stated that the employee had eczema from contact with irritant chemicals used in his work. The doctor prescribed medication. Starting on May 21, the employee followed the directions and prescriptions of the dermatologist. Two days later the skin condition became so violent that the employee, on his own volition, stopped using the medication. The employee returned to the dermatologist on May 24 for further examination and treatment and was relieved of his duties and not cleared to return to work until May 27.

Decision: This should be considered a temporary total disability in accordance with the ultimate extent of disability. The committee believed that this was covered by paragraph 5.15 of the standard.

CASE 880 (5.2)

On May 23, a millwright was engaged in loading some scrap pipe on a truck with several other employees. They had already hauled several loads. As he bent over to reach for a length of pipe on the ground, he felt a "catch" in his back. No weight was being picked up or moved. On May 24, the employee was examined by the doctor, who diagnosed the injury as multiple muscle strain of the lower back. The employee was given muscle relaxants, which did not relieve the condition, however. On May 26, the employee was admitted to the hospital for traction. He returned to work on June 27.

Decision: This should be considered an industrial injury and included in the work injury rates in accordance with the ultimate extent of disability on the basis that this case complies with both paragraph 5.2(a) and paragraph 5.2(b) of the standard. Although no lift was being made at the specific moment when the pain developed, this moment cannot be considered separately from the total activity of the employee at this time.

CASE 881

Borderline case. Not to be used as a precedent.

CASE 882 (5.3)

While at work, an employee sustained an abrasion of the cornea of his left eye from a foreign body. Because of poor vision in the uninjured eye (20/400), the doctor would not allow the employee to return to work until the abrasion healed. The doctor indicated he would not necessarily have kept the employee from working if his vision in his uninjured eye had been better. The question was raised whether this injury should be excluded in accordance with provisions of paragraph 5.4 of the standard.

Decision: This should be considered an industrial injury and should be included in the rates in accordance with the ultimate extent of disability. The committee ruled that the injury could not be excluded under 5.4 since it did not arise solely due to poor vision.

CASE 883 (5.12.2)

During a field construction job a severe rain storm struck and the employees were directed to take shelter. The employee in question, along with several other employees, took shelter in a metal-clad change house. The employee stood almost directly in the doorway and, it is assumed, was leaning against the door jamb. He was wet with rain and perspiration as were the other men standing with him in the doorway. The door was wide open and rain had blown in onto the concrete floor. Lightning struck an unknown location in the immediate proximity of the building. The employee slumped to the floor. Instantaneously, the safety inspector was called to the scene and immediately began administering mouth-to-mouth resuscitation. An ambulance arrived within ten minutes and mechanical resuscitation was administered en route to the hospital. The employee was pronounced dead upon arrival. No damage to the change house from lightning was found.

Decision: This should be considered an industrial fatality and included in the work injury rates. Without evidence to the contrary, the committee assumed that the employee was killed by a lightning stroke, and agreed that on this type of field work lightning should be recognized as a hazard of employment.

CASE 884 (1.6)

A plant maintenance superintendent at an electrical generating plant was working on emergency duty, because of a strike, which consisted of twelve hours on duty, followed by twelve hours off duty. On the sixth day of the strike, the employee undertook the job of cleaning a floor, which was a part of his emergency duties, using a motor-powered floor-scrubbing machine. The employee carried three or four buckets of water a short distance to fill the machine, added three or four pounds of soap, and received instructions on how to operate the machine. This machine does not require much physical effort to operate it, but for one not familiar with its use it does require a certain amount of effort in steering, and the employee did experience some difficulty in this respect.

After making four or five trips around the room, the machine ran out of gasoline.

While a fellow worker went to an adjacent building to get some gasoline, the employee went to the maintenance office to rest. He complained of not feeling well. He became sick to his stomach, got worse, and suffered a fatal heart attack a few minutes later. The employee was dead on arrival at the hospital. This was the only time or place he was seen by a physician. The attending physician would not make a statement as to the cause of the heart attack.

However, the company's general medical consultant, when asked for an opinion, made the statement: "I do think that the unaccustomed exertion involved in guiding and manipulating the floor-scrubbing machine could have precipitated his heart attack." He further explained that the intended meaning of the words "could have," in the context used, was that "according to reasonable medical probabilities the activities involved precipitated his heart attack." The general medical consultant also stated that, in his opinion, the employee could have suffered the heart attack while doing anything or nothing, but the fact that the employee did do something requiring a little extra exertion could be a causal factor in his death.

Decision: This should be considered an industrial fatality and included in the work injury rates. The deceased was performing duties which were unusual to him; and the company's general medical consultant stated that it was probable that these activities precipitated the heart attack.

STANDARDS FROM OTHER COUNTRIES

Members of the American Standards Association may borrow from the ASA Library copies of any of the following standards recently received from other countries. Information about those standards not selected for listing in THE MAGAZINE OF STANDARDS may also be obtained from the ASA library. Orders for these standards may be sent to the country of origin through the ASA office. Titles are given here in English, but, execpt where otherwise indicated, documents are in the language of the country from which they were received. For the convenience of readers, the standards are listed under their general Universal Decimal Classification numbr. In ordering copies, please refer to the number following the title of the standard.

614.8 ACCIDENT PREVENTION. SAFETY

Australia (SAA)

Automatic fire alarm installations C.A. 15-1961

Safety belts and harness assemblies for motor vehicles E. 35-1961

Belgium (IBN)

Fire-fighting equipment. Respiratory safety equipment NBN 440

621.3 ELECTRICAL ENGINEERING

Argentina (IRAM)

Polyvinyl-chloride-insulated copper wire IRAM 2143

Australia (SAA)

Flameproof enclosure of electrical equipment C. 98-1961

Austria (ONORM)

Insulated flat and braided copper conductors ONORM E 3703

Belgium (IBN)

Electric incandescent lamps, 6.6 amp, for aircraft NBN 474

Canada (CSA)

Electrical features of fuel-burning equipment (gas and oil); forming part of Canadian Electrical Code, Part 2, safety stds for electrical equipment C22.2 No. 3-1961

Air-cooled transformers (dry type) C22.2 No. 47-1961

India (ISI)

Stationary cells and batteries, lead-acid type IS: 1651-1960*

Fixed capacitors for fans IS: 1709-1960*

Israel (SII)

Power transformers for radio receivers and electronic equipment S. I: 366*

Spain (IRATRA)

Transformers for arc welding UNE 14030

Union of South Africa (SABS)

Impulsing energy regulators for electric heating units SABS 186-1960

Bitumen-base filling compounds for electrical purposes SABS 625-1960

United Kingdom (BSI)

Schedule of letter symbols for light-current semiconductor devices (mainly for use in catalogs and similar technical literature) BS 3363:1961

Marking and arrangement of switchgear busbars main connections and small wiring BS 158:1961

Exciter lamps BS 1015:1961

Butyl-rubber-insulated cables and cords with heat-resisting fiber layer BS 3387:1961

USSR

Microphone carbon powders. Test methods GOST 6131-61

Electric measuring instruments. Interchangeable shunts GOST 8042-61

Track-limit switches. General technical requirements GOST 9601-61

Cambric (linoxine) insulated tubing GOST 9614-61

Glass fiber separators for storage batteries GOST 9636-61

Glass insulators for aerial communication lines GOST 9648-61

Low-power electron tubes. Method of measuring equivalent resistance of noises GOST 9662-61

Electrical capacitors. Series of voltage rating GOST 9665-61

Power transformers (including autotransformers) from 10 kva and above. Series of power rating GOST 9680-61

Bimetallic copper-steel wire GOST 3822-61

Bare bimetallic copper-steel wires GOST 4775-60

Aluminum and copper-aluminum cable shoes, fastened by pressing GOST 9581-60

4 stds for three-phase and single-phase power supply from 0.5 to 1000 kw. Series of nominal standard powers and r.p.m. GOST 9630/3-61

621.791 WELDING AND ALLIED TECHNIQUES

Argentina (IRAM)

Gas welding IRAM 582

Mechanical test of welds IRAM 609

Arc-welding machines, transformer type IRAM 2145

Germany (DNA)

Metal arc-welding electrodes for joint welding; testing of electrodes; weld-metal test DIN 1913 Sht. 2*

Rules for testing steel welders DIN 8560 Sht. 1*

Switzerland (SNV)

2 stds for point-welding aluminum and aluminum alloys VSM 14110/1

United Kingdom (BSI)

Specification for class 2 metal-arc welding of steel pipe lines and pipe assemblies for carrying fluids BS 2971:1961

629.113 AUTOMOTIVE ENGINEERING

Argentina (IRAM)

Self-lubricating sintered bearings IRAM 5114

Canada (CSA)

Lighting for commercial vehicles CS D106-1961

France (AFNOR)

Electrical horn, "high-frequency" type NF R 143-06

Two-hole flanges, light type NF R 164-01

2 stds for trailer's axle NF R 427-02/03

Wire rope and sheath for flexible command NF R 953-01

631.3 AGRICULTURAL IMPLEMENTS, TOOLS, MACHINERY

Austria (ONORM)

Brake drums of farm carts ONORM V 5201

Wheel base and spring location on axles of farm carts ONORM V 5202

India (ISI)

Construction of underground rural food grain storage structures IS:603-1960

Switzerland (SNV)

Tractor, power-take-off VSM 28450

Mower, knife sections VSM 28510

*Available in English

USSR

Tractors. Drawbars. Location and basic dimensions GOST 3481-61

643 HOUSEHOLD EQUIPMENT

France (AFNOR)

Metal step ladder, folding, household NF D 28-401

Kitchen stove for solid fuels, continuous action NF D 32-301

Union of South Africa (SABS)

Electric heating pads and blankets SABS 184-1960

United Kingdom (BSI)

Specifications for the testing and approval of domestic electrical appliances.
- Electric fires BS 3456:Section A2:1961
- Electric kettles BS 3456:Section A3:1961
- Electric toasters BS 3456:Section A5:1961
- Electric coffee percolators BS 3456:Section A6:1961
- Electric washboilers BS 3456:Section A7:1961
- Electric vacuum cleaners BS 3456:Section B2:1961

Paper towelling and dispensing cabinets BS 1439:1961

Culinary bailing bowls BS 2974:1961

Aluminum pudding basins BS 3390:1961

Aluminum pie dishes BS 3391:1961

Tinned steel baking dishes BS 3393:1961

651.712 PAPER SIZES

Belgium (IBN)

Paper sizes NBN 18

Germany (DNA)

Sizes of paper according to DIN 476 DIN 198*

Portugal (IGPAI)

Sizes of different business stationery, derived from Series A, general survey NP 4

2 stds for official letter heads and second pages, size A4 NP 5,6

2 stds for labels and envelopes NP 7,8

2 stds for index cards, pads NP 10, 11

3 stds for plain and window envelopes, note-letters NP 13/15

Paper sizes series 4 AO to A10, BO to B10, CO to C10 NP 17

Archive classifiers with cardboard boxes NP 24

665.4/.5 MINERAL OILS, WAXES

Belgium (IBN)

Petroleum products. Kinematic viscosity for opaque oils NBN 52.019

Petroleum products. Copper strip corrosion by petroleum products NBN 52.077

* Available in English

France (AFNOR)

Bomb test for sulfur content in mineral oils and lubricants NF T 60-109

Moisture contents in mineral oils NF T 60-113

India (ISI)

Method for gaging of petroleum and liquid petroleum products IS:1518-1960*

Switzerland (SNV)

Quality requirements for automobile, aviation, tractor, and reactive engine fuels SNV 81161

674 WOOD INDUSTRY

Australia (SAA)

Specifications for milled products from North-Eastern Australian eucalypt hardwoods O.66 through O.69-1960

Belgium (IBN)

Appearance classification of softwood of Belgian origin NBN 544

Canada (CSA)

Physical properties of power- and communication-wood crossarms O116-1961

France (AFNOR)

12 stds for different physical and mechanical tests of artifical wallboards made of pressed wood particles NF B 51-200 through 51-211

7 stds for different wood-preserving chemicals NF T 72-056/7, 060/4

Wood preservation by means of insecticides NF X 41-507

Wood preservation by superficial impregnation with fungicides NF X 41-510

10 draft standards put in practical application for different tests of wood-fiber boards PN B 51-100/106, 108/10

India (ISI)

Methods of test for plywood

Blockboards IS:1659-1960*
IS:1734-1960*

Union of South Africa (SABS)

Glossary of timber terms and definitions O65-1960

United Kingdom (BSI)

Methods of test for toxicity of wood preservatives to fungi BS 838:1961

USSR

10 stds for tests for glued plywood GOST 9620/9-61

678.5 PLASTICS

Germany (DNA)

Laminated plastic paper and fabric sheets DIN 7735*

Injection molding material: cellulose-acetate butyrate DIN 7743*

* Available in English

STATEMENT REQUIRED BY THE ACT OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, JULY 2, 1946 AND JUNE 11, 1960 (74 STAT. 208) SHOWING THE OWNERSHIP, MANAGEMENT, AND CIRCULATION OF

THE MAGAZINE OF STANDARDS, published monthly at New York, N. Y., for Oct. 1, 1961.

1. The names and addresses of the publisher, editor, managing editor, and business managers are: Publisher: American Standards Association, Incorporated, 10 East 40th Street, New York 16, N. Y. Editor: Ruth E. Mason, 10 East 40th Street, New York 16, N. Y. Managing editor: None. Business manager: None.

2. The owner is: American Standards Association, Incorporated, 10 East 40th Street, New York 16, N. Y. John R. Townsend, President; Frank H. Roby, Vice-President; George F. Hussey, Jr, Managing Director and Secretary.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent of more of total amount of bonds, mortgages, or other securities are: None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was: (This information is required by the act of June 11, 1960 to be included in all statements regardless of frequency of issue.) 9028

Ruth E. Mason
Editor

Sworn to and subscribed before me this 11th day of September, 1961.

Lydia I. Gustafsson

Notary Public, State of New York
No. 60-1608150
Qualified in Westchester County
Commission Expires March 30, 1963

Tensile test of thin plastic sheets and films DIN 53371*

Light-fastness of plastics DIN 53388*

Torsion pendulum test of plastics DIN 53445*

India (ISI)

Cellulose nitrate for use in coated fabrics IS:1627-1960

Portugal (IGPAI)

7 stds for different physical and chemical tests of agar-agar NP 225/6, 228/232

Spain (IRATRA)

Bursting resistance of round rigid plastic tubes UNE 53 044

Determination of volatility of plastifyers UNE 53 096

United Kingdom (BSI)

Electrical resistance of conductive and anti-static products made from flexible polymeric material BS 2050:1961

USSR

Vinyl chloride polymer rigid sheeting GOST 9639-61

* Available in English

• NEWS BRIEFS

THE AMERICAN Society of Association Executives has chosen Vice Admiral G. F. Hussey, Jr, managing director of the American Standards Association, as one of the first group of executives to receive its designation as a chartered Association Executive. The Society presented charters to 34 association executives whom it found to be qualified to bear the new title. The presentation, the first time for such an event, was made at the Society's meeting in Denver, Colorado, September 3.

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THE NEW American Standard Specifications for Standard Shapes and Sizes of Grinding Wheels, B74.2-1960, will mean the elimination of waste, faster delivery of parts, reduced obsolescence, and simplified procedures, H. J. Jeffers reports. Mr Jeffers, sales manager, Bonded Abrasives Division, The Carborundum Company, is chairman of Sectional Committee B74. The committee is sponsored by the Grinding Wheel Institute.

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JOHN L. HAGUE, a national authority in the field of analytical chemistry, has been appointed chief of the Standard Reference Materials Section of the National Bureau of Standards. Mr Hague had been acting chief of the predecessor section, Analytical Chemistry, since March 1960.

The Standard Reference Materials Section will play an important role in the Bureau's standard materials program. In this program, the Bureau makes available for distribution to science and industry more than 550 different standards of metals, ores, ceramics, chemicals, hydrocarbons, and more recently added radioactive materials, uranium isotopes, lithium ores, aluminum refractories, and phosphor materials. Standard materials are used to check, evaluate, and standardize methods of analysis and analytical techniques and substances, and to develop new and improved methods and instruments.

•

THE NATIONAL Bureau of Standards has discontinued the certification of emf of unsaturated standard cells as of June 30, 1961. It is making an exception, however, for public utilities and other agencies having operations that require these services from the Bureau. This action is in keeping with its long-standing policy of discontinuing measurement services which become adequately available at other laboratories, the Bureau explains. It will continue to conduct referee tests or to undertake calibration of unsaturated cells when special or unusual circumstances are involved.

The Bureau does not recommend, endorse, approve, or accept responsibility for the work of other laboratories. However, it can provide organizations requiring this calibration service with addresses of nearby laboratories offering such assistance.

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INCREASED reliance upon standards and standardization programs to offset the cost-profit squeeze is reported by 67 companies responding to an American Standards Association questionnaire. Without exception, all firms stated that their standards activities had contributed substantially to reducing costs.

Specific savings information was made available by 15 of the companies. Percentage-wise, the savings range from 1 to 20 percent of gross income. On a dollar savings ratio, other companies reported a range of $3 to $5 gained for each $1 put into standards work.

Over two-thirds of the companies indicated that standardization is being extended to more areas of company operations. That this is being accomplished through company standards committees utilizing a standards engineering staff for administrative servicing is indicated by responses to three related questions. Two-thirds of the companies reported no recent increase in either standards personnel or department budget. However, over half indicated that company standards committees are being widely used.

Slightly more than half reported that company standards are mandatory once introduced into the standards manuals and made available for general internal use. A total of 62 companies said that American Standards approved by the American Standards Association are used in the company standards programs.

The Davenport Manufacturing Division of Duncan Electric Company, Inc, reported a 20 percent savings achieved through its standards programs. The department of public utilities, City of Richmond, cites a 10 percent savings. The Food Machinery and Chemical Corporation, through its Central Engineering Laboratories, reported that approximately $5 was saved for each $1 spent.

The Fluor Corporation reported savings of $75,000. The Jeffrey Manufacturing Company reports that, "Dollar savings are all indirect and are not figured. There is no doubt that tremendous savings are being made."

All but one company answered in the affirmative that company standardization had the full support of top management.

Thompson Ramo Woolridge, Inc, commented that savings data are not available because of decentralized operations, and that each division or independent group conducts its own standardization in compliance with corporate policy.

Western Electric Company stated that its "promotion of standards is a continuing important part of planning that has taken on special importance during the period of rising costs. The company's standardardization program has been one of the factors that has helped to hold the line on the price level of its products. At the same time, those products have been improved in terms of service life, performance, and over-all quality."

E. I. du Pont de Nemours & Company, Inc, commented that standardization is being extended to more areas of company operation with standards being arrived at through company standards committees. Its savings are estimated at $4 per $1 spent on standards work. The extension of standards work into new areas is being accomplished at present without an increase in the company standards staff or the company standards budget.

The Taft-Peirce Manufacturing Company stated that its standards programs are constantly being expanded to more areas of operation and the company standards committees are the prime vehicles for its programs.

Cessna Aircraft Company and Polaroid Corporation are among the 18 companies reporting an increase in standards budgets and are among the 49 companies noting an extension of standardization to additional company operations.

THE AMERICAN SOCIETY for Testing and Materials, has presented to the government of India a master set of visual quality standards for mica. The presentation was made at a luncheon during the 64th Annual Meeting of the Society in Atlantic City, N.J. in June. These standards, to be used in the quality grading of mica for export from India to this country, have long been the basis for purchasing mica both by American industry and the United States government. In presenting the standard, ASTM president A. Allan Bates expressed pleasure at this opportunity for the Society to be of direct assistance in preparation of standards useful in ensuring quality understanding between Indian producers and domestic consumers of mica. President Bates also expressed appreciation on behalf of the Society to the ASTM Task Group of Committee D-9 on Electrical Insulating Materials which inspected hundreds of samples of mica received from India to select the standard set. The Task Group was composed of Harold E. Brafman, chairman, Sprague Electric Company; Joseph A. Saladino, Cornell-Dubilier Electric Corporation; Joseph K. Noll, Schwab Brothers Corporation; Frank F. Watts, Gillespie-Rogers-Pyatt Company; Frank Koehler, Otto Gerdau Company; Yvonne Blanchard, Manchard Trading Corporation; Robert St. Peter, Leonard J. Buck, Inc; and Bradley Johnson, General Services Administration. Each sample was visually inspected and compared with the master set of mica standards corresponding with the ASTM standards for Specification for Natural Muscovite Mica Based on Visual Quality (D 351-60 T).

The committee prepared a similar master set of mica standards some time ago for the General Services Administration which has used them in the domestic program for stockpiling of mica. India requested a similar set of the standards after they were viewed at a meeting of the International Organization for Standardization held in Harrogate, England, in 1958. The request, which originated with the Mica Export Promotion Council—an arm of the Indian government—was transmitted to ASTM via the Indian Standards Institution and the American Standards Association with a pledge of American assistance from the U.S. State Department in a memorandum from the Secretary of State.

The mineral mica, long known as isinglass and formerly used as windows in oil stoves, now is of strategic importance to the electronics industry because of its excellent electrical insulating properties. After being mined, the mineral is cleaned, the edges trimmed, and the layers of mica split by hand with meticulous care into thin sheets along natural cleavages. Although attempts have been made to develop mechanical splitters, these have been largely unsuccessful and mica splitting remains a skilled art—as much as six months being required to train a mica splitter.

Because mica in the form in which it is used in the electronics industry must be handled with automatic equipment, it is necessary that it be highly uniform and free from minor defects, including waviness, certain stains, and impurities which might affect either electrical or temperature properties. It is for these reasons that visual standards are still found necessary in the grading of mica, the eye yet being the most sensitive instrument for detecting these minor flaws.

The following classifications of mica, both for visual quality and waviness, were selected by the committee and prepared and framed by the Sprague Electric Company:

V2—Clear and Slightly Stained
V3—Fair Stained
V4—Good Stained
V5—Stained "A"
V6—Stained "B"
V7—Heavy Stained

ASTM President A. Allan Bates (center) presents scroll authenticating the mica standards to C. J. Stracey (left), representing the Minister, Embassy of India, and Mr. I. Subramanya (right) acting for the consul-General of India, New York.

ORGANIZED STANDARDIZATION

THE FIRST of a new series of three-day seminars on Organized Standardization will be held by Dr John Gaillard, consultant on industrial standardization, from January 30 through February 1, 1962, in the Barbizon Plaza Hotel, New York City. Each day two conferences will be held (9 a.m. to noon, and 1 to 4 p.m.) where the principal subjects will be presented by the seminar leader and discussed around the table. A general discussion period (4 to 5 p.m.) will give the conferees an opportunity further to review the subjects considered and also to bring up some problems in which they have a special interest.

The first day will cover the fundamental philosophy of organized standardization and an analysis of the basic approach to the formulation of standards in general. The second day will be devoted to a review of standardization as an integral function of management, and the organization of standardization work, particularly in the individual company. On the third day, the various forms of applied standardization technique; some important "tools" of the standardizer; and the art of writing standards and specifications will be discussed.

For further details and registration, write or phone Dr John Gaillard, 135 Old Palisade Road, Fort Lee, New Jersey.

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THE NATIONAL Bureau of Standards has received an appropriation of $1,000,000 of U.S.-owned foreign currencies to be used for scientific research in foreign countries. Dr Franz L. Alt, coordinator of Special International Programs, will handle the establishment and operation of the projects.

The research programs will be undertaken in India, Pakistan, and Israel and will include projects which complement and supplement the research programs undertaken in the Bureau's laboratories. In establishing the program, Dr Alt will work through the State Department, U.S. Embassies, and the governments of the countries involved.

Dr Alt has specialized in computing machines and numerical methods. As assistant chief of the Applied Mathematics Division, he has worked with computing machines and their application to military tactical problems, mathematical methods in management, pattern recognition, and machine translation of languages.

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ARTHUR S. JOHNSON, past chairman of ASA's Standards Council, has resigned as a member of the ASA Board of Directors because of his retirement as vice-president, American Mutual Liability Insurance Company, Wakefield, Massachusetts. Mr Johnson will be sadly missed in ASA work. His understanding of the principles of standardization and his dedication to the program under the procedures of ASA has made him an especially valuable member of the various committees and boards on which he has worked. Recently he has been chairman of the Council Study Committee on Coordination Between Federal Government and Industry Standards. Mr Johnson has also resigned from the chairmanship of this committee.

In accepting his resignation, the Board of Directors adopted a resolution expressing its deep appreciation for the services he has rendered to ASA on the Board of Directors, on the many committees on which he has served, as well as on the Standards Council, of which he has served as chairman.

The Board also expressed its appreciation to the American Mutual Liability Insurance Company for the time which Mr Johnson was able to devote to the ASA.

AMERICAN STANDARDS

Just Published . . .

If your company is a member of the American Standards Association, it is entitled to receive membership service copies of these newly published American Standards. The ASA contact in your company receives a bimonthly announcement of new American Standards, which also serves as an order form. Find out who your ASA contact is and order your American Standards through him. He will make sure your company receives the service to which it is entitled.

CINEMATOGRAPHY

Nomenclature for Motion-Picture Film Used in Studios and Processing Laboratories, PH22.56-1961 (Revision of Z22.56-1947) $0.70

Sponsor: Society of Motion Picture and Television Engineers

MECHANICAL

Addenda B3.11a-1961 to American Standard Method of Evaluating Load Ratings for Ball and Roller Bearings, B3.11-1959 $0.40

Provides limitations of contact angles for various types of ball bearings in applying load rating formulas given in B3.11-1959.

Sponsor: Anti-Friction Bearing Manufacturers Association

MEDICAL

Anesthetic Equipment: Endotracheal Tube Connectors and Adapters, Z79.2-1961 $1.00

Describes general objectives, terminology, dimensions and tolerances, labeling and materials for a nominal 15 mm (0.609 inch) OD connection utilized in joining an endotracheal tube to the anesthetic circuit.

Sponsor: American Society of Anesthesiologists

PHOTOGRAPHY

Thickness of Photographic Paper, Designation for, PH1.1-1961 (Revision of PH1.1-1953) $0.40

Classifies unprocessed, silver-sensitized photographic paper in terms of average thickness groups.

Sponsor: Photographic Standards Board

PIPE AND FITTINGS

Steel Pipe Flanges and Flanged Fittings, B16.5-1961 (Revision of B16.5-1957, including Addendum B16.5a-1960) $3.00

Covers pressure-temperature ratings, sizes, and methods of designating openings, marking, minimum material requirements, dimensions, tolerances, and tests for cast and forged steel flanges and flanged fittings. Pressure-temperature ratings for flanges of Types 304L and 316L stainless steel are also included.

Sponsors: American Society of Mechanical Engineers; Manufacturers Standardization Society of the Valve and Fittings Industry; Mechanical Contractors Association of America

Seamless Alloy Steel Boiler, Superheater, and Heat Exchanger Tubes, Tentative Specifications for, ASTM A 213-59T; ASME SA-213; ASA B36.17-1961 (Revision of ASTM A 213-55T; ASME SA-213; ASA B36.17-1956) $0.30

Seamless and Welded Austenitic Stainless Steel Pipe, Tentative Specifications for, ASTM A 312-59T; ASME SA-312; ASA B36.26-1961 (Revision of ASTM A 312-55; ASME SA-312; ASA B36.26-1956) $0.30

Welded Austenitic Stainless Steel Boiler, Superheater, Heat Exchanger, and Condenser Tubes, Tentative Specifications for, ASTM A 249-59T; ASME SA-249; ASA B36.33-1961 (Revision of ASTM A 249-55T; ASME SA-249; ASA B36.33-1956) $0.30

Seamless Austenitic Chromium-Nickel Steel Still Tubes for Refinery Service, Standard Specifications for, ASTM A 271-59; ASA B36.39-1961 (Revision of ASTM A 271-55; ASA B36.39-1956) $0.30

Sponsors: American Society of Mechanical Engineers; American Society for Testing and Materials

TEXTILES

Colorfastness of Dyed Textiles to Atmospheric Oxides of Nitrogen, AATCC 23-1957; ASA L14.54-1960 (Revision of L14.54-1951) $0.50

Covers procedure for determining the resistance to color change of dyed textile fabrics when exposed to atmospheric oxides of nitrogen.

Colorfastness to Perspiration, AATCC 15-1957; ASA L14.56-1960 (Revision of L14.56-1956) $0.40

Determines the fastness of colored tex-

tiles to the effects of perspiration. It is applicable to dyed, printed or otherwise colored textile yarns and fabrics of all kinds and to the testing of dyestuffs as applied to textiles.

Resistance to Wetting (Static Immersion Absorption Test), AATCC 21-1957; ASA L14.61-1960 (Revision of L14.61-1956) $0.40

Measures the resistance of fabrics to wetting by water. It is especially suitable for measuring the water-repellent efficacy of finishes applied to fabrics, especially wool fabrics and napped fabrics of all fibers which are sometimes difficult to rate precisely by means of the Standard Spray Test.

Resistance of Textiles to Insects, AATCC 24-1952; ASA L14.64-1960 (Revision of L14.64-1951) $0.50

Covers biological procedures for determining the resistance to insect pests of textiles that contain wool or other susceptible fibers. The test methods described here are not concerned with the various procedures for treating textiles or with their subsequent handling, aging, washing, or cleaning.

Sponsors: American Association of Textile Chemists and Colorists; American Society for Testing and Materials

In Process . . .

As of October 10, 1961

BUILDING AND CONSTRUCTION

American Standards Approved

Chemical Analysis of Portland Cement, Method of, Part I, ASTM C 114-58; ASA A1.5-1961 (Revision of ASTM C 114-53; ASA A1.5-1954)

Fineness of Portland Cement, Method of Test by Turbidimeter, ASTM C 115-58; ASA A1.7-1961 (Revision of ASTM C 115-53; ASA A1.7-1954)

Air Content of Hydraulic Cement Mortar, Method of Test for, ASTM C 185-59; ASA A1.9-1961 (Revision of ASTM C 185-53T; ASA A1.9-1954)

Heat of Hydration of Portland Cement, Method of Test, ASTM C 186-55; ASA A1.10-1961 (Revision of ASTM C 186-53; ASA A1.10-1954)

Normal Consistency of Hydraulic Cement, Method of Test, ASTM C 187-58; ASA A1.11-1961 (Revision of ASTM C 187-49; ASA A1.11-1950)

Tensile Strength of Hydraulic Cement Mortars, Method of Test, ASTM C 190-59; ASA A1.14-1961 (Revision of ASTM C 190-49; ASA A1.14-1950)

Time of Setting of Hydraulic Cement, Method of Test by Vicat Needle, ASTM C 191-58; ASA A1.15-1961 (Revision of ASTM C 191-52; ASA A1.15-1954)

Time of Setting of Hydraulic Cement, Method of Test by Gillmore Needle, ASTM C 266-58T; ASA A1.17-1961 (Revision of ASTM C 266-51T; ASA A1.17-1954)

Natural Cement, Specification for, ASTM C 10-54; AASHO M 135-49; Federal SS-C-185; ASA A1.18-1961

Fineness of Portland Cement, Method of Test by Air-Permeability Apparatus, ASTM C 204-55; AASHO T 153-52; Federal 158; ASA A1.19-1961

Flow Table for Use in Tests of Hydraulic Cement, Specification for, ASTM C 230-57T; ASA A1.20-1961

Slag Cement, Specification for, ASTM C 358-58; ASA A1.21-1961

Cement Content of Hardened Portland Cement Concrete, Method of Test, ASTM C 85-54; ASA A1.22-1961

Mechanical Mixing of Hydraulic Cement Mortars of Plastic Consistency, Method of, ASTM C 305-59T; ASA A1.23-1961

Air-Entraining Additions for Use in the Manufacture of Air-Entraining Portland Cement, Specification for, ASTM C 226-58T; ASA A1.24-1961

Portland-Pozzolan Cement, Specification for, ASTM C 340-58T; ASA A1.25-1961

Sponsor: American Society for Testing and Materials

Interior Marble, Specifications for, A94.1-1961 (Revision of A94.1-1948)

Thin Exterior Marble Veneer (Two Inches and Less in Thickness), Specifications for, A94.2-1961 (Revision of A94.2-1955)

Thin Exterior Marble in Curtain or Panel Walls, Specifications for, A94.3-1961 (Revision of A94.3-1955)

Sponsor: Marble Institute of America

In Board of Review

Making Buildings and Facilities Accessible and Usable to the Physically Handicapped, Specifications for, A117.1-

Sponsors: National Society for Crippled Children and Adults; The President's Committee on Employment of the Physically Handicapped

Reaffirmation Being Considered

Specific Gravity of Hydraulic Cement, Method of Test, ASTM C 188-44; ASA A1.12-1948

Sponsor: American Society for Testing and Materials

CHEMICAL

American Standard Approved

Common Name for the Pest Control Chemical 3-amino-*s*-triazole (or 3-amino-1,2,4-triazole): amitrole, K62.24-1961

Sponsor: U.S. Department of Agriculture

In Standards Board

Common Name for the Pest Control Chemical 2-chloro-4-ethylamino-6-isopropylamino-*s*-triazine: atrazine, K62.26-

Common Name for the Pest Control Chemical 2-chloro-4, 6-bis (diethylamino)-*s*-triazine: chlorazine, K62.27-

Sponsor: U.S. Department of Agriculture

CINEMATOGRAPHY

In Board of Review

35mm Photographic Sound Motion-Picture Film Usage in Camera, PH22.2- (Revision of PH22.2-1954)

16mm Multi-Azimuth Test Film, Magnetic Type, PH22.126-

Sponsor: Society of Motion Picture and Television Engineers

DRAWINGS, SYMBOLS AND ABBREVIATIONS

American Standard Approved

Graphic Symbols for Process Flow Diagrams in the Petroleum and Chemical Industries, Y32.11-1961

Sponsors: American Society of Mechanical Engineers; American Institute of Electrical Engineers

Reaffirmation Being Considered

Letter Symbols for Chemical Engineering, Y10.12-1955 (Revision of Z10.12-1946)

Sponsor: American Society of Mechanical Engineers

ELECTRIC AND ELECTRONIC

American Standards Approved

Supplements to American Standard Requirements, Terminology, and Test Code for Distribution Power and Regulating Transformers and Reactors Other Than Current Limiting Reactors, C57.12-

Terminology, C57.12.80a-1961 (Supplement to C57.12.80-1958)

Test Code, C57.12.90a-1961 (Supplement to C57.12.90-1958)

Sponsor: Electrical Standards Board

In Standards Board

Differential Gain and Differential Phase, Method of Measurement, (60 IRE 23.S1) ASA C16.33-

Sponsor: Institute of Radio Engineers

Rolled Aluminum Rods (EC Grade) for Electrical Purposes, Specifications for, ASTM B 233-61; ASA C7.23- (Revision of ASTM B 233-60; ASA C7.23-1960)

Resistivity of Electrical Conductor Materials, Method of Test for, ASTM B 193-61; ASA C7.24- (Revision of ASTM B 193-60; ASA C7.24-1960)

Three-Quarter Hard Aluminum Wire for Electrical Purposes, Specifications for, ASTM B 262-61; ASA C7.35- (Revision of ASTM B 262-56; ASA C7.35-1956)

Standard Nominal Diameters and Cross-Sectional Areas of Awg Sizes of Solid Round Wires used as Electrical Conductors, Specifications for, ASTM B 258-61; ASA C7.36- (Revision of ASTM B 258-57; (ASA C7.36-1958)

Half-Hard Aluminum Wire for Electrical Purposes, Specification for, ASTM B 323-61; ASA C7.42- (Revision of ASTM B 323-60; ASA C7.42-1960)

Electrical Conductivity by Use of Eddy Currents, Method of Test for, ASTM B 342-61T; ASA C7.44-

Sponsor: American Society for Testing and Materials

Reaffirmation Being Considered

Bronze Trolley Wire, Specifications for, ASTM B 9-55; ASA C7.5-1956

Copper Trolley Wire, Specifications for, ASTM B 47-55; ASA C7.6-1956

Hard-Drawn Copper Alloy Wires for Electrical Conductors, Specifications for, ASTM B 105-55; ASA C7.10-1956

Figure-9 Deep-Section Grooved and Figure-8 Copper Trolley Wire for Industrial Haulage, Specifications for, ASTM B 116-55; ASA C7.11-1956

Hard-Drawn Copper Covered Steel Wire, Specifications for, ASTM B 227-57; ASA C7.17-1958

Concentric-Lay-Stranded Copper Covered Steel Conductors, Specifications for, ASTM B 228-56; ASA C7.18-1957

Concentric-Lay-Stranded Copper and Copper Covered Steel Composite Conductors, Specifications for, ASTM B 229-56; ASA C7.19-1957

Sponsor: American Society for Testing and Materials

GAS BURNING APPLIANCES

In Standards Board

Approval Requirements for:

Domestic Gas Ranges, Volume I, Free-Standing Units, Z21.1.1- (Revision of Z21.1.1-1959 and Z21.1.1a-1960)

Domestic Gas Ranges, Volume II, Built-In Domestic Cooking Units, Z21.1.2- (Revision of Z21.1.2-1959 and Z21.1.2a-1960)

Domestic Gas Clothes Dryers, Z21.5- (Revision of Z21.5-1959 and Z21.5a-1960)

Central Heating Gas Appliances, Volume I, Steam and Hot Water Boilers, Z21.13.1- (Revision of Z21.13.1-1958, Z21.13.1a-1959, and Z21.13.1b-1960)

Central Heating Gas Appliances, Volume II, Gravity and Forced Air Central Furnaces, Z21.13.2- (Revision of Z21.13.2-1960)

Central Heating Gas Appliances, Volume III, Gravity and Fan-Type Floor Furnaces, Z21.13.3- (Revision of Z21.13.3-1959, Z21.13.13a-1960, and Z21.13.3b-1960)

Central Heating Gas Appliances, Volume IV, Gravity and Fan-Type Vented Recessed Heaters, Z21.13.4- (Revision of Z21.13.4-1958, Z21.13.4a-1959, and Z21.13.4b-1960)

Gas Unit Heaters, Z21.16- (Revision of Z21.16-1960)

Refrigerators Using Gas Fuel, Z21.19- (Revision of Z21.19-1960)

Gas Appliance Thermostats, Z21.23- (Revision of Z21.23-1940)

Gas-Fired Duct Furnaces, Z21.34- (Revision of Z21.34-1958, Z21.34a-1959, and Z21.34b-1960)

Gas-Fired Absorption Summer Air-Conditioning Appliances, Z21.40.1- (Revision of Z21.40-1959 and Z21.40a-1960)

Gas Engine Powered Summer Air-Conditioning Appliances, Z21.40.2-

Addenda

Addenda Z21.3a- to Approval Requirements for Hotel and Restaurant Gas Ranges and Unit Broilers, Z21.3-1960

Addenda Z21.6a- to Approval Requirements for Domestic Gas-Fired Incinerators, Z21.6-1960

Addenda Z21.10.1a- to Approval Requirements for Gas Water Heaters, Volume I, Z21.10.1-1960

Addenda Z21.10.2b- to Approval Requirements for Gas Water Heaters, Volume II, Z21.10.2-1959 and Z21.10.2a-1960

Addenda Z21.10.3a- to Approval Requirements for Gas Water Heaters, Volume III, Z21.10.3-1960

Addenda Z21.27b- to Approval Requirements for Hotel and Restaurant Gas Deep-Fat Fryers, Z21.27-1959 and Z21.27a-1960

Addenda Z21.28a- to Approval Requirements for Portable Gas Baking and Roasting Ovens, Z21.28-1960

Sponsor: American Gas Association

MECHANICAL

American Standards Approved

Spindle Flanges for Precision Boring Machines, B5.39-1961

Sponsors: American Society of Tool and Manufacturing Engineers; American Society of Mechanical Engineers; Metal Cutting Tool Institute; National Machine Tool Builders' Association; Society of Automotive Engineers

Carbide Blanks and Cutting Tools, Single Point, Carbide Tipped, Roller Turner Type, B81.1-1961

Sponsor: Cemented Carbide Producers Association

In Board of Review

Slotted and Recessed Head Wood Screws, B18.6.1- (Revision of B18.6.1-1956)

Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers

MISCELLANEOUS

American Standard Approved

Sieves for Testing Purposes, Specifications for, ASTM E 11-61; ASA Z23.1-1961 (Revision of ASTM E 11-58T; ASA Z23.1-1959)

Sponsors: American Society for Testing and Materials; National Bureau of Standards

PLASTICS

American Standard Approved

Ethyl Cellulose Molding and Extrusion Compounds, Specification for, ASTM D 787-61T; ASA K64.1-1961 (Revision of ASTM D 787-55; ASA K64.1-1959)

Sponsor: American Society for Testing and Materials

SAFETY

In Board of Review

Installation of Blower and Exhaust Systems for Dust, Stock and Vapor Removal or Conveying, Z33.1- (Revision of Z33.1-1959)

Sponsor: National Fire Protection Association

In Standards Board

Installation and Operation of Pulverized-Fuel Systems, Z12.1- (Revision of Z12.1-1959)

Sponsor: National Fire Protection Association

Ethylene Dichloride, Maximal Acceptable Concentration of, Z37.21-

Methyl Bromide, Maximal Acceptable Concentration of, Z37.24-

Sponsor: American Industrial Hygiene Association

AMERICAN STANDARDS PROJECTS

Radio and Electronic Equipment, C16—

Sponsor: Institute of Radio Engineers

Dr Ernest Weber, president of Polytechnic Institute of Brooklyn, has been elected chairman of Sectional Committee C16. Dr Weber is a pioneer in high-frequency electronic research, and holds more than 50 American, Canadian, and British patents in the field of microwave techniques.

A native of Vienna, Austria, he first worked at the Austrian Siemens-Schuckert Company as research engineer and was transferred to the Berlin company in 1929. He was also appointed lecturer at the Technical University of Berlin. Dr Weber came to the U.S. in 1930 as visiting professor at the Polytechnic Institute of Brooklyn. A year later, he was named a permanent research professor of electrical engineering in charge of graduate study, and from 1942 to 1945 he was professor of graduate electrical engineering and head of graduate study and research in that field. For his research on microwaves, during the war, he was awarded the Presidential Certificate of Merit.

Dr Weber has served as president of the Institute of Radio Engineers and as a member of the Army's Scientific Advisory Committee.

Dr Ernest Weber

Fluid Permeation, Z59—

Sponsor: American Geophysical Union

This project has been officially withdrawn because of lack of interest and lack of activity.

Low-Voltage Cartridge Fuses, 600 Volts or Less, C97—

Sponsors: American Institute of Electrical Engineers; National Electrical Manufacturers Association

On the request of the American Institute of Electrical Engineers, the American Standards Association has approved initiation of this new project. The scope of work will be recommended by the sectional committee when it is organized.

Guide for Selecting Greek Letters Used as Symbols for Engineering Mathematics, Y10.17-1961

Sponsor: The American Society of Mechanical Engineers

Correction

On page 4 of American Standard Y10.17-1961, type faces 37 have been identified as "mu" whereas the identification should have been "nu."

Code for Pressure Piping, B31—

Sponsor: The American Society of Mechanical Engineers

Interpretations submitted by the sponsor

From time to time, actions of Sectional Committee B31 interpreting the approved B31 standards are published for the information of those interested. These do not, of course, constitute a revision of the B31 standards, but they may be used in preparing specifications or in other ways as representing the considered opinions of the committee.

CASE N-11 (Reopened) Requirements on Expansion Joints

Inquiry: What means may be used to provide thermal expansion in nuclear piping systems?

Reply: It is the opinion of the committee that any sound means of providing for thermal expansion may be used. It is recommended that these means be provided by plain or corrugated pipe bends, offsets, changes in direction of the pipe line itself, or bellows expansion joints. Whatever means are used must meet the following requirements:

(1) Provision for expansion must meet the requirements of American

(Continued on page 350)

STANDARDS ALIVE

A Guest Column

by W. P. KLIMENT

STANDARDS ARE FINAL and fixed only as long as they serve a purpose; consequently, they should be recognized as being temporary in nature.

In order for a standard to be of any value, it must be flexible and must be under constant review so as to keep in step with our technical progress. A standard is never written for all time. It may be out of date the day it is published and before the ink is dry. In my opinion, this is progress in our complex world.

The exhibits at the International Trade Fair held in Chicago recently showed clearly the scientific and technological progress made by other countries, and which in many cases exceed us in ingenuity and design.

The advances made in space travel, as recorded daily by the press, are further evidence that we cannot be complacent..

In many cases we spend years in promulgating standards. This also applies to making simple revisions, such as in terminology, selection of words, and other minor details of an editorial nature. These delays often are due primarily to the insistence of individuals who raise objections which reflect personal opinion or opinions of small minority groups rather than opinions of a great number of users and manufacturers whom they represent. Such suggestions may not necessarily enhance or change the intent of the standard. Unquestionably, in a great number of cases these differences are resolved by discussion and arbitration; at times, in order to resolve differences and overcome delays, the chairman must make fair and unbiased decisions.

To maintain our democratic way of doing things, everyone is entitled to his day in court; however, if the democratic principle is to work effectively, it is the duty of everyone on a standards committee to consider carefully the thinking and suggestions of others. The worst enemy of our democratic way is the closed mind which refuses to accept changes that benefit a majority rather than a small special interest group, and by so refusing prevents or delays any action at all. Until we accept the philosophy that it is to our benefit as well as the benefit of others to consider and whenever possible to accept the thinking and suggestions of others, we will be confronted with delays and differences which will be mutually harmful to us all.

Mr. Kliment, a past chairman of ASA's Company Member Conference and past member of the Standards Council, is engineer of standards, Industrial Products Group, Engineering Division, Crane Company, Chicago. He was awarded the Standards Medal in 1958 for his "indefatigable efforts and outstanding achievements in the practical development and application of voluntary standards."

Standard B31.1-1955, Section 6, Chapter 3.

(2) Materials used must be recognized by B31.1 and Code cases prefixed by N as satisfactory for the specified conditions.

(3) If of a sliding or swivel type, they must have a positive seal or a leakoff which reasonably assures that the leakoff will be contained within the main or auxiliary nuclear piping systems.

(4) The designer is cautioned for unusual thermal expansion due to rapid temperature fluctuations, especially in liquid metal piping systems.

CASE N-12 — Procedures for Qualifying New Materials for Use in Nuclear Piping Systems.

Inquiry: What is the procedure for qualifying new material for use in nuclear piping systems?

Reply: The qualification procedure for materials, whether new or commercially available in nuclear piping systems, has been established as one of the standards by the Committee on Nuclear Piping of ASA B31. The procedure is believed to be a uniform method of handling inquiries and working stress determinations. The procedure which follows incorporates criteria that are presently accepted for high-pressure steam piping as well as nuclear requirements that appear to be pertinent for material acceptance.

1. *ASTM Identification*

It is desirable that the material be identified with an ASTM standard specification or an ASTM tentative specification. If the material varies only slightly from an ASTM specification by the addition, for example, of a small amount of alloying element, it should be stated that the material will comply with that specification except as noted. The exception should be stated as to chemical composition and to mechanical properties based on test results and tensile data.

2. *Alternate Identification*

If no ASTM specification can be applied, the following information shall be given in the same form as used by the ASTM, giving ranges of values within which it is commercially practical to reproduce the material rather than an exact determination of the properties.

a. Chemical composition showing all significant alloying elements including ferrous material, carbon, manganese, phosphorous, sulfur, and silicon, together with alloying elements, if any. The maximum content of the following residual elements shall also be furnished: cobalt, tantalum, and boron.

b. Ultimate tensile and yield properties, over the temperature range of contemplated service. Where the materials are to be stress-relieved or heat-treated, the tensile tests shall be made after the specimens are similarly treated.

3. *Creep and Stress Rupture Data*

a. Creep strength over any temperature range of contemplated service within which creep will lower the working strength of the material.

b. The stress-rupture strength over any temperature range within which the material might fail by rupturing.

c. Basis for establishing stress values may be found in Paragraph A-150 ASME Boiler and Pressure Vessel Code Section 1, (1959).

4. *Physical Properties*

a. In the case of materials of which no previous use in any form or similar analysis has been had in nuclear service, the specific heat, the coefficient of thermal conductivity and the coefficient of thermal expansion shall be furnished when the material is intended for use in nuclear services where it may be subjected to severe thermal shocks.

5. *Heat Treatment*

Any heat treatment required to produced the specified tensile properties shall be described.

6. *Hardness Measurements*

The Brinell or Rockwell hardness of the material, in the state which it will be used, shall be given unless this information is well known.

7. *Impact Strength and Transition Temperature*

If the material is to be used at low temperatures, below −20F, the impact strength at the lowest temperature to which it will be subjected, or at some lower temperature, shall be given. The impact strength shall be determined in accordance with the requirements of Par. UG-84 of Section VIII of the ASME Boiler and Unfired Pressure Vessel Code, or "V" notch data. It is also suggested that the material transition temperature for percent ductile fracture, energy absorbed, and lateral expansion plotted against temperature, and any other pertinent data be furnished using impact testing methods outlined in UG-84 specified above.

8. *Radiation and Temperature Effects*

It is important to state whether the new material is subject to critical changes in physical and mechanical characteristics caused by irradiation or by temperatures within the range of use or fabrication. By this is meant a marked change in brittleness, hardness, ductility, impact strength, grain size, etc.

9. *Microstructure Variations*

It should also be stated whether the material is subject to age-hardening or critical structural changes by a combination of physical and temperature conditions, such, for example, as the age-hardening of certain aluminum alloys after cold-working and subsequent heat-treatment. This is particularly important for conditions which may occur during fabrication that result in such critical changes.

10. *Availability*

It should be stated whether the material is commercially available and can be purchased within the specified range of chemical composition and mechanical properties. If the material is covered by patents so that it cannot be manufactured by anyone who wishes to use it without securing a license or paying royalties, it should be so stated.

11. *Weldability*

a. If the material is to be welded, it should be stated whether any special procedure is required for arc or gas welding and the amount of experience available for determining the weldability. It should also be stated whether the material is subject to air-hardening during welding. If a special procedure must be followed in welding the material, or if the weldment must be pre-heated, stress-relieved, or heat-treated after welding, the procedure should be specified, including the proper temperatures.

b. It is recommended that the tests described in Section IX of the ASME Boiler and Unfired Pressure Vessel Code or their equivalent be made, unless equivalent information is available.

12. *Test Results*

Tests, results of which are submitted to the Piping Code Committee, should be made on representative thicknesses of materials contemplated, in accordance with ASTM testing methods.

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